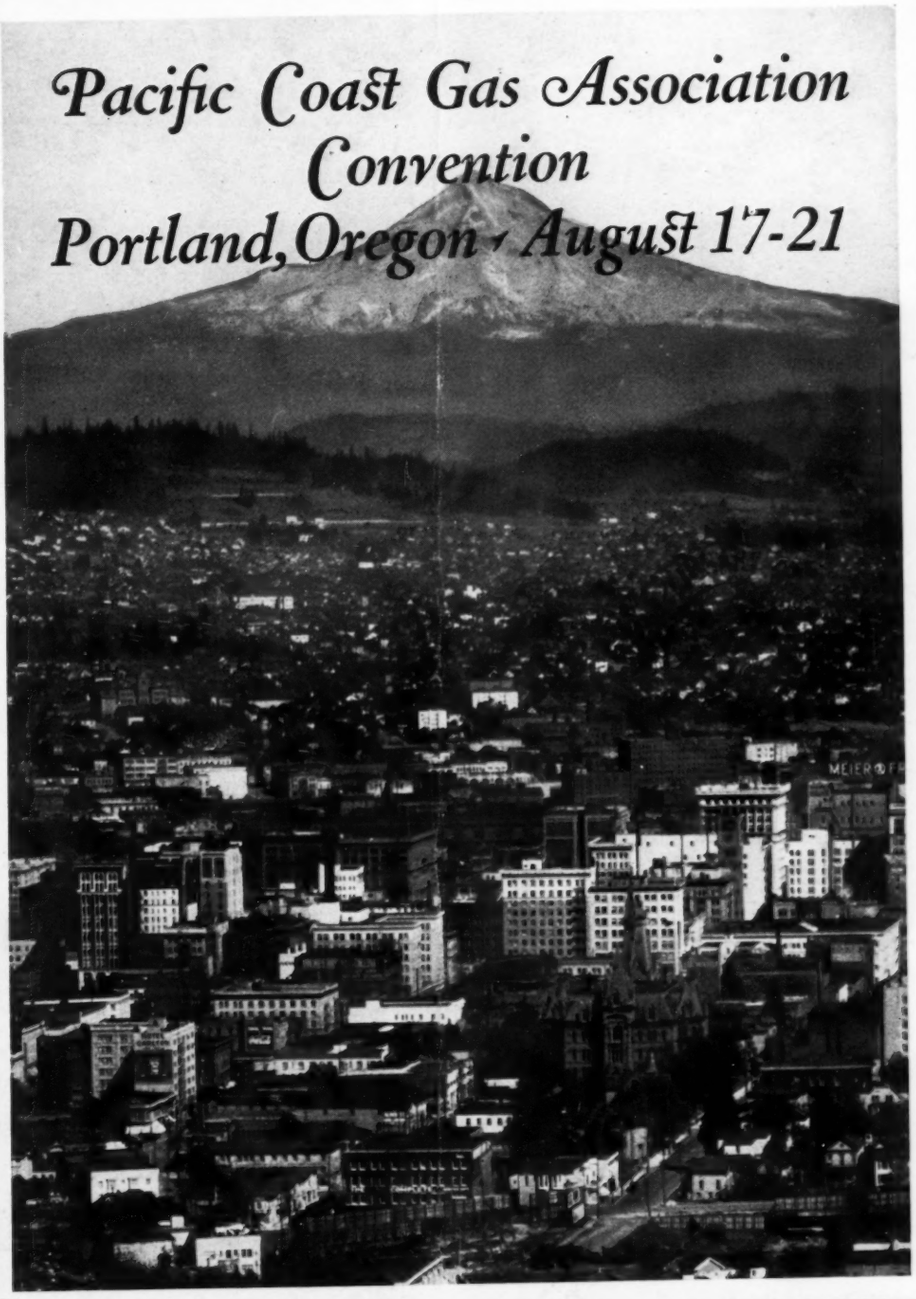
WESTERN GAS

ugust
1925

Pacific Coast Gas Association Convention
Portland, Oregon - August 17-21



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A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

The KEY PASTE Family

It originated because of an insistent demand from practically every class of industry. All felt the need for a universal screw thread and gasket compound, with a high degree of tightness and safety to replace the commonly used red lead, graphite and oil, litharge, glycerine, shellacs, etc., all of which have their disadvantages. KEY PASTE IS MEETING THE NEEDS OF THE GAS INDUSTRY.

What KEY PASTE Does

It effectually lubricates and seals any screw thread or gasket joint.

Expands under heat instead of contracting, filling in every little crack and crevice, permitting the use of old fittings with the same degree of safety as new ones.

Gaskets can be used a number of times when put up with Key Paste.

Joints, no matter how old, can easily be broken.

It is a patented compound that can't be equaled for the purpose.

It is a non-corrosive filler that is oil and gasoline proof, with a heat-resisting power of approximately 4500 degrees, and impervious to the attacks of acids.

A size for Every Need.

IT STOPS THE LEAKS AND KEEPS 'EM STOPPED!

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MEET KEY AT THE CONVENTION. FREE SAMPLES AND DEMONSTRATION.

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THERE IS A
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Contents for August

Business District of Portland, Ore., Showing Mt. Hood in the Background.....Cover

How the Association Is Serving Dealers..... 21
By E. L. Hall

Representative Papers Prepared for Portland Convention—In Abstract Form..... 23

St. Peter's Dome, Scenic Landmark near Portland, Ore..... 25

Portland Views Reveal Association Progress —Portland Panorama Will Represent Entire West.....26-27

Scenes Along the Columbia River, Near Portland, Ore..... 28

Editorial 34

Some Phases of Gas Utility Rate Making..... 35
By Claude C. Brown

The Complete Program of the Convention at Portland 38

Natural Gas Fuel Now Generates Electricity for Pasadena..... 39
By George H. Finley

Meeting an Unusual Emergency in Santa Barbara Gas Service..... 40
By Clyde H. Potter

Testing Natural Gas for Gasoline Content.... 42

Selling the Apartment House to the Use of Gas Fuel..... 43
By C. M. Robert

Appliance Dealers Unite in New Association.. 44
By Geo. Finney

Sell the Idea—Forget the Price..... 46
By H. Elliott Taylor

Successful Merchandising Practice Is Discussed by Authority..... 50

Fruit Canning Stimulus Is Used to Boost Gas Range Sales..... 54

This Month's Patents Pertaining to the Industry 55

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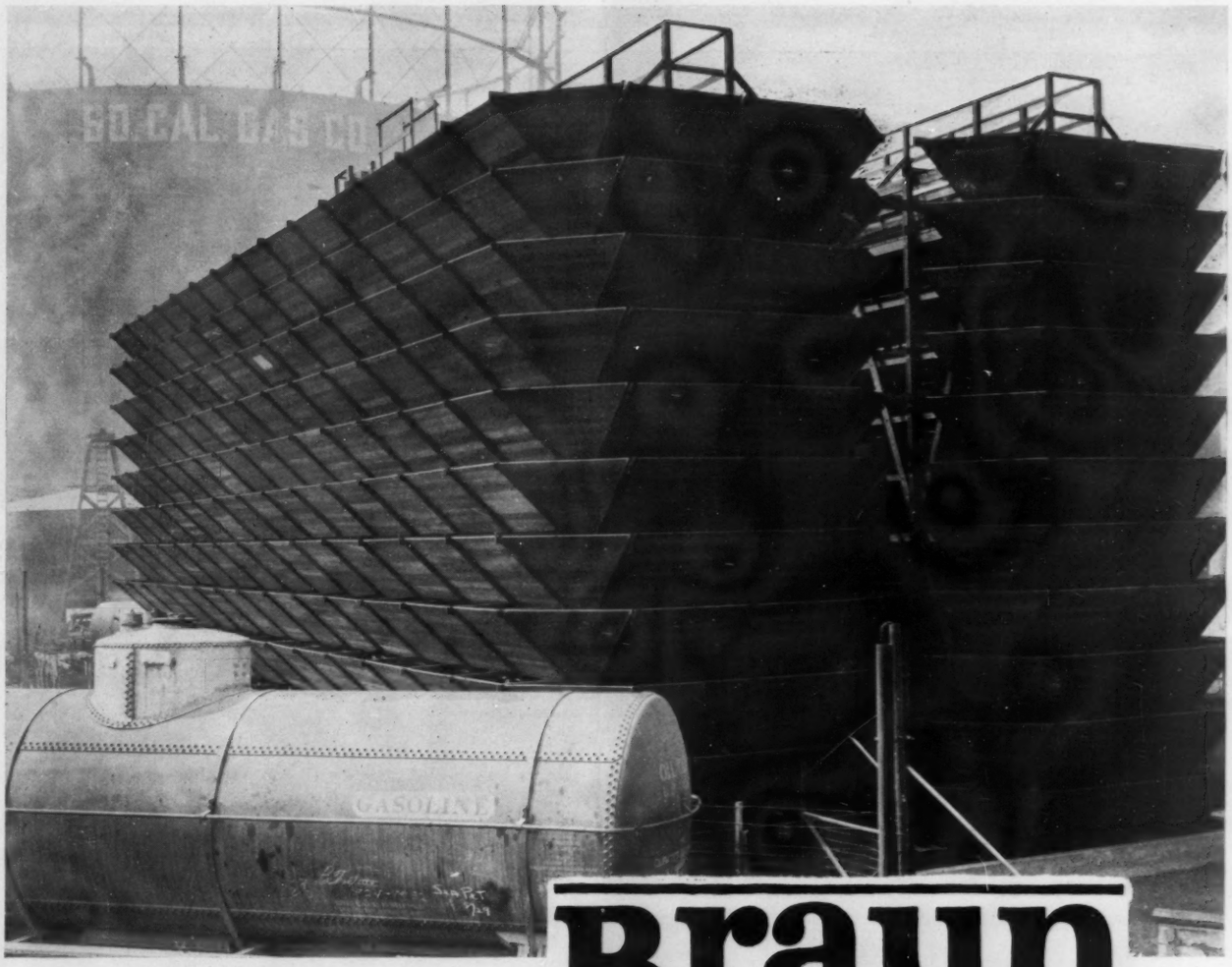

A Braun cooling tower installation in a Southern California gas plant. Capacity 2500 gals. of water per minute.

Braun

Atmospheric Cooling Towers

ECONOMICAL performance is insured by the scientific design of Braun Cooling Towers. They fulfill the requirements of

—uniform water distribution
—sufficient cooling surface
—accessibility for cleaning
—minimum water losses by windage
—low operating costs.

Let our engineers consult with you on your particular cooling tower problem.

Bulletin 114 covers thoroughly the subject of cooling towers. It will be sent upon request.

C.F. Braun & Co.

Manufacturing Mechanical Engineers

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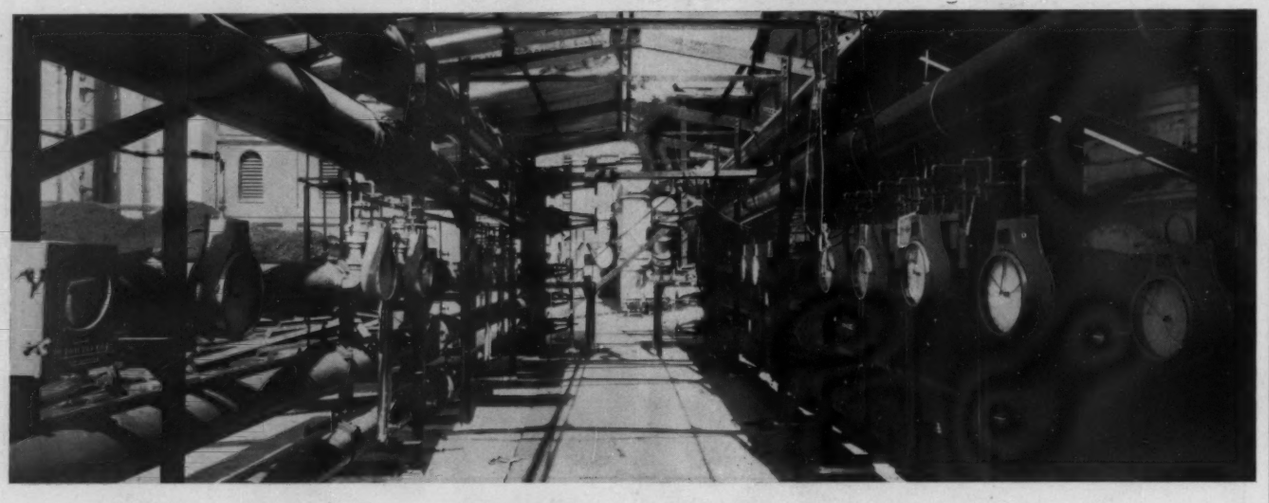

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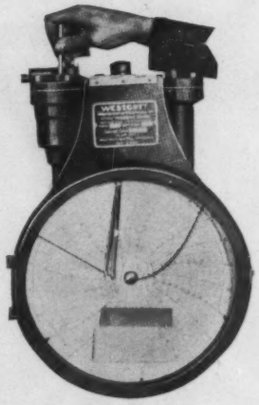
Used where accuracy counts

This master meter installation at the Los Angeles Gas & Electric Corporation plant, for the measurement of natural gas, is one of the largest in the world, with a maximum daily capacity of 70,000,000 cupic feet. This same type of meter is adaptable throughout the plant for accurate measurement of steam, water, oil, air and gas.

When the nature of a measuring problem requires a meter that will perform with *dependable* accuracy under extra heavy duty, most operators will make careful comparisons before they select their instrument. Here is where *Westcott* Orifice *Meters* come into their own. They are invariably the choice of men who have had an opportunity to study operating records. Their POSITIVE ACCURACY is uncanny, and the fact that many of the first *Westcott* Orifice *Meters* made are still in service denotes their DEPENDABILITY. The minimum number of moving parts and the simplicity of design make the *Wescott* Orifice *Meter* a most efficient *Standard* of measurement.



Write for Bulletin No. 120 which explains their design and construction in detail.

Manufactured by

METRIC METAL WORKS

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Engineers

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Sand Cast—Centrifugally Cast

For High Pressure Gas Mains
For Low Pressure Gas Mains

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Uniform Thickness
Uniform Grain
Dense Structure
High Tensile Strength
Maximum Elasticity
Free from Ordinary Foundry Defects
Smooth Inside and Outside
Annealed to a Workable Softness

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USCIPIPE
UNITED STATES CAST IRON PIPE
OUTLASTS THE
AND FOUNDRY COMPANY
AGES
MORE THAN 250 YEARS OLD

Plain End
Bell and Spigot
Flanged Joints

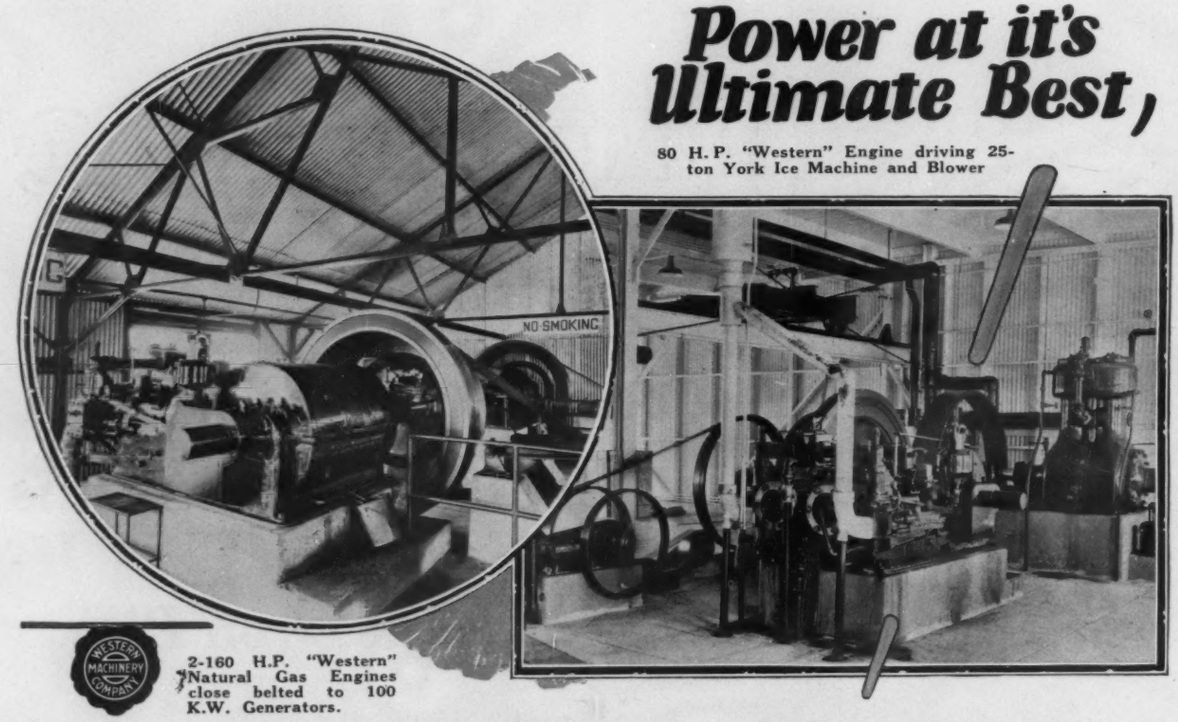
deLavaud Pipe is made in sizes from 4″ to 16″ diameter. Sand cast pipe in all size — 2″ to 96″ diameter.

United States Cast Iron Pipe and Foundry Company

LOS ANGELES **SAN FRANCISCO** **SEATTLE**

Cast Iron Pipe is Permanent Construction

Power at it's Ultimate Best,



80 H. P. "Western" Engine driving 25-ton York Ice Machine and Blower

2-160 H.P. "Western" Natural Gas Engines close belted to 100 K.W. Generators.

Gas & "WESTERN" Natural Gas Engines

Where gas is available there is no power quite so satisfactory from every angle as that produced by "Western" Natural Gas Engines from this economical fuel. It is economical, it is efficient, it is dependable, and it is always immediately available—it is power at its ultimate best.

Hundreds of thousands of horsepower of "Western" Natural Gas Engines on the Pacific Coast daily are furnishing additional proof of the many advantages of gas power for a wide range of purposes, and providing an efficient, economical, dependable solution to the power problems encountered in this field.

A Partial List of "Western" Owners in Southern California

Industrial Plants

1.	Western Glass Co.	960 H.P.
2.	Peerless Laundry	160 "
3.	California-Oregon Paper Mills	320 "
4.	Los Angeles Paper Mills	160 "
5.	Owens Brick Co.	160 "
6.	Consumers' Rock & Gravel Co.	160 "
7.	Big Tejunga Rock & Gravel Co.	240 "

Ice & Refrigeration

1.	Pasadena Ice Company	80 H.P.
2.	Pasadena Ice Company (Repeat Order)	80 "
3.	Santa Ana Commercial Co.	120 "
4.	Santa Ana Com. Co. (Repeat Order)	60 "
5.	Anaheim Creamery & Ice Co.	60 "
6.	Home Ice Company	2-80 "
7.	Mountain View Dairies	80 "
8.	Imperial Ice & C. S. Co.	160 "
9.	Puritan Ice Company	160 "
10.	Crescent Creamery	4-120 "
11.	Crescent Creamery	160 "
13.	Burbank Ice & C. S. Co. (Repeat Order)	60 "
13.	Burbank Ice & C. S. Co. (Repeat Order	60 "
14.	Ord Ice Company	80 "
15.	National Ice Company	120 "
16.	Orange Belt Ice Company	80 "
17.	National Ice & C. S. Co. (Repeat Order)	100 "
18.	National Ice & C. S. Co. (Repeat Order)	120 "
19.	Imperial Ice Company (Repeat Order)	100 H.P.

Compressor Plants

1.	Shell Company of California	34-160 H.P. Units
2.	Standard Oil Company	118-160 " "
3.	Pan American Petroleum Co.	30-160 " "
4.	Midway Gas Company	36-160 " "
5.	City of Long Beach	16-160 " "
6.	General Petroleum Corp.	8-160 " "
7.	Los Angeles Gasoline Corp.	6-160 " "
8.	Pacific Gasoline Co.	18-160 " "
9.	Brea Canyon Oil Company	5-160 " "
10.	United Oil Company	4-160 " "
11.	Cerritos Gas Company	3-160 " "
12.	Southern Calif. Gas Company	2-160 " "
13.	Western Gasoline & Ref'g. Co.	2-160 " "
14.	Long Beach Gas & Ref'g. Co.	2-160 " "
15.	Mutual Refining Co.	1-160 " "
16.	Calumet Oil Company	1-160 " "
17.	Belridge Oil Company	1-160 " "

Irrigation Service

1.	Anaheim Union Water Company	120 H.P.
2.	Anaheim Eucalyptus Water Company	180 "
3.	Azusa Irrigating Company	320 "
4.	Azusa Agricultural Water Company	160 "
5.	California Domestic Water Company	240 "
6.	Chino Water Company	215 "
7.	Citizens Land & Water Company	840 "
8.	City of Monrovia	560 H.P.
9.	City of Ontario	480 "
10.	City of Glendora	160 "
11.	City of Orange	120 "
12.	City of Newport Beach	40 "
13.	City of Compton	120 "
14.	Clearwater Company	100 "
15.	Columbia Land & Water Co.	130 "
16.	Cucamonga Water Co.	320 "
17.	Crescenta Mutual Water Co.	120 "
18.	El Modena Mutual Irrigation Co.	160 "
19.	Euclid Water Co.	160 "
20.	Evergreen Ranch	80 "
21.	Glendora Consol. Mutual Irrigation Co.	970 "
22.	Glendora Independent Water Co.	650 "
23.	La Sierra Water Co.	210 "
24.	La Bolsa Tile Co.	110 "
25.	L. V. W. Brown Estate (Fuller & Bell)	170 "
26.	Lemon Heights Water Co.	160 "
27.	Mount Antonio Water Co.	160 "
28.	Monrovia Acres Water Co.	120 "
29.	North Corona Land Co.	510 "
30.	Narbonne Ranch Water Co.	60 "
31.	Riverside Highlands Water Co.	340 "
32.	Riverside 350" Water Co.	240 "
22.	Yorba Linda Water Co.	740 "
34.	Whittier Water Co.	900 "

Western Machinery Company

General Offices & Factory:
906 North Main Street

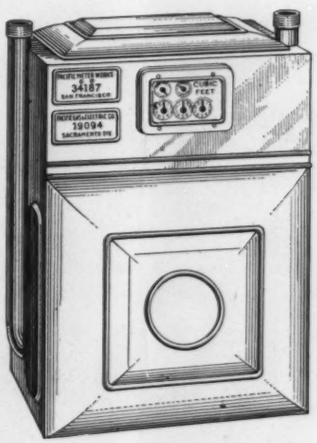
Los Angeles, California

San Francisco Offices & Factory:
Eighteenth and Alabama Streets

Pacific Meter Works

OF

AMERICAN METER COMPANY
INCORPORATED



GAS METERS
AND
GAS TESTING
APPARATUS

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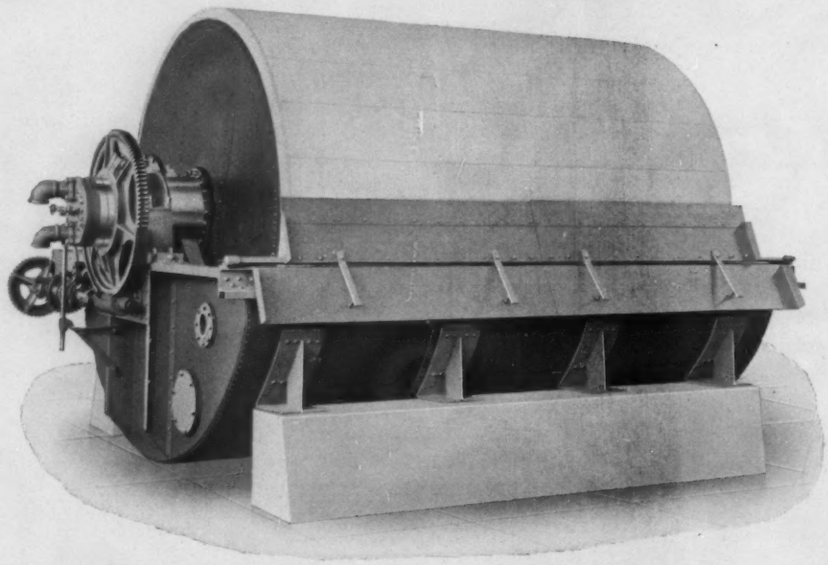
LOS ANGELES

Dewatering Lampblack

In Gas Manufacturing Plants
Can Be Simplified and Expedited
By Using

OLIVER FILTRATION



Over Thirty OLIVER FILTERS and
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Are in Use on the Pacific Coast
For This Purpose.

Oliver Continuous Filter Co.

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NEW YORK
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LONDON
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E. L. Bateman, The Corner House

GAS ---*the fuel of Quality Production*

The use of Gas is the direct route to plant efficiency. It reduces the time required by the old methods, and thus increases production while it decreases overhead.

The flow of Gas is easily regulated to follow any desired heat curve. And too, Gas is smokeless, sootless, dirtless—all heat—no waste. It is paid for after using—not before.

Discuss your fuel problems with our industrial gas engineers—it may result in instituting the year's greatest saving at your plant — and their services are yours, without charge or obligation.

PACIFIC GAS AND ELECTRIC COMPANY

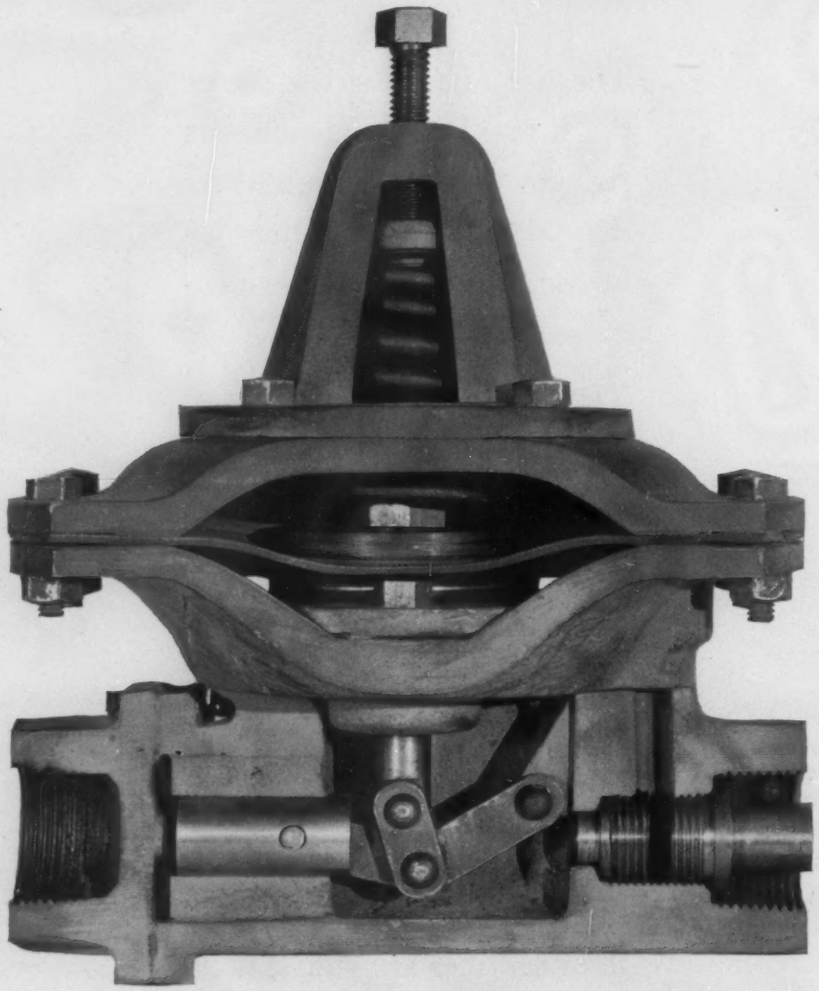
P·G·and E·

"PACIFIC SERVICE"

"If it's done with heat—you can do it better with Gas"

SOMETHING NEW

Reliance High to High *Compound Regulator*



Otto Goldkamp Patents

A REGULATOR that will deliver gas without drop in pressure from desired lock-up pressures.

Tests demonstrate that a ¾ inch regulator working on 65 pounds inlet pressure, set to lock up at 10 pounds, will start delivery at 8 to 9 pounds—as load increases, pressure will automatically increase until a delivery pressure of 12 to 14 pounds will be secured with a capacity of over 4000 feet per hour.

Can you beat it with ¾ inch inlet and outlet and 5/16 inch valve orifice?

THIS capacity, which is over 100% greater than any regulator of this size on the market, is obtained by the use of the well known Reliance toggle joint action, which also insures positive, permanent lock-up.

Otto Goldkamp of San Diego is the designer of the compounding feature.

Three-quarter inch sizes ready for delivery September 1st; larger sizes to follow.

See the Sample at Portland Meeting

Isbell-Porter Company
Newark, New Jersey

Reliance Manufacturing Company
Pasadena, California

"Where Rolls the Oregon"

NOT so many years ago, caravans of men and beasts and covered wagons were slowly fighting their way across the Rockies and down the western slope to the peaceful valleys of the Pacific. They came from every part of the East but their one object was to settle in that promised land, discovered by Lewis and Clark, "Where Rolls the Oregon."

Vastly different today is the promised land of the covered wagon days. Great cities stand where once roamed tribes of Indians and the wheels of industry make music where once grew giant forests. Gone forever is the Overland Trail but in its wake have come the iron horse, the automobile and the aeroplane.

During the present month the eyes of the gas industry of the Pacific Coast will be turned toward Portland, Oregon, where the 32nd annual convention of the Pacific Coast Gas Association will be held. From many cities of the coast representatives of this great industry will head their automobiles toward Portland as their forefathers did in the days of the Overland Trail.

The contact formed at conventions is invaluable. It enables men of the same business to rub shoulders and discuss mutual problems. It broadens and stimulates for the coming year.

Portland is waiting to welcome the delegates in a typical western fashion. She will do her utmost to see that each visitor is well received and cared for in a way known only to Portland.

Get behind the Pacific Coast Gas Association, tune up the modern covered wagon, head your course northward and follow the trail of the pioneers to the land "Where Rolls the Oregon."

SOUTHERN COUNTIES GAS COMPANY

Sixth Floor,
Los Angeles Gas & Electric Corp. Building,
Los Angeles, Calif.

They Cost More

Because They Are Worth More

Conservative Executives realize it costs big money to get real gas consumers on their lines and hold them in competition with other fuels.

There are real reasons why several gas companies are now buying and installing, free of charge, Mettler Entrained Combustion Gas Burners rather than have their customers install inferior equipment on their lines.

Better one consumer permanently sold and equipped than fifty that have to be resold every year.

135,000 B. H. P. Now Permanently Equipped

Our catalogue to you on request

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"If it's done with heat, you can do it BETTER with gas"

Mettler Entrained Combustion Gas Burners
FOR ALL Purposes Kinds of gas Pressures
406 S. Main St. LEE B. METTLER, CO. Los Angeles, Cal.

Buy in the West and get the best

Conservatism

The application of natural gas to the needs of the industries, and the delivery of it to the homes of Southern California, has been one of the great achievements in the history of conservation of our state.

The pioneer days of the gas industry have passed; but we still have to work and plan so that the greatest good will accrue to the greatest number.

In many ways pioneer work is easier, and it is covered with a glamour of romance. Yet the task which is now before us is no less vital to the continued prosperity and development of Southern California.

Co-operation, with an end to conserve and use to the best advantage this natural resource, must be considered seriously by everyone who produces or uses gas.

Southern California
Gas Company

950 South Broadway, Los Angeles

Don't Store Lampblack

Stirling Boilers Solve the Lampblack Problem in the San Francisco (Protrero) and Oakland Plants of the Pacific Gas and Electric Co.

Stirling double end fired boilers enable you to burn all of your lampblack, effecting double economies in operation costs. You are able to use all your fuel---and use it as it is made.

The Babcock & Wilcox Company

B. & W. and Stirling Boilers

CHAS. C. MOORE, Pacific Coast Manager
Sheldon Bldg., San Francisco, Calif.

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Standard Bank Bldg., Vancouver, B. C.

Coast Valleys Gas and Electric Company
Mountain States Power Company
San Diego Consolidated Gas and Electric Co.
Sierra and San Francisco Power Company
Western States Gas and Electric Company

operate public utility properties in 149 communities in California, Oregon, Washington, Idaho, Montana and Wyoming. They have a combined electric capacity of 189,820 horsepower, of which 87,320 is hydro-electric. For the year ended June 30, 1925, their gross earnings exceeded $12,252,000.

Coast Valleys Gas and Electric Company operates in Monterey, Salinas Pacific Grove, Carmel, King City, San Ardo and elsewhere in the Salinas Valley.

San Diego Consolidated Gas and Electric Company serves, without competition, a population of 147,000 in San Diego and vicinity.

Mountain States Power Company operates four utility groups in Oregon, Washington, Montana, Idaho and Wyoming, serving 57 communities having total population of 275,000.

Western States Gas and Electric Company, serves 36 communities, including Stockton, Richmond and Eureka. The Company or its predecessors have been in successful operation for 36 years.

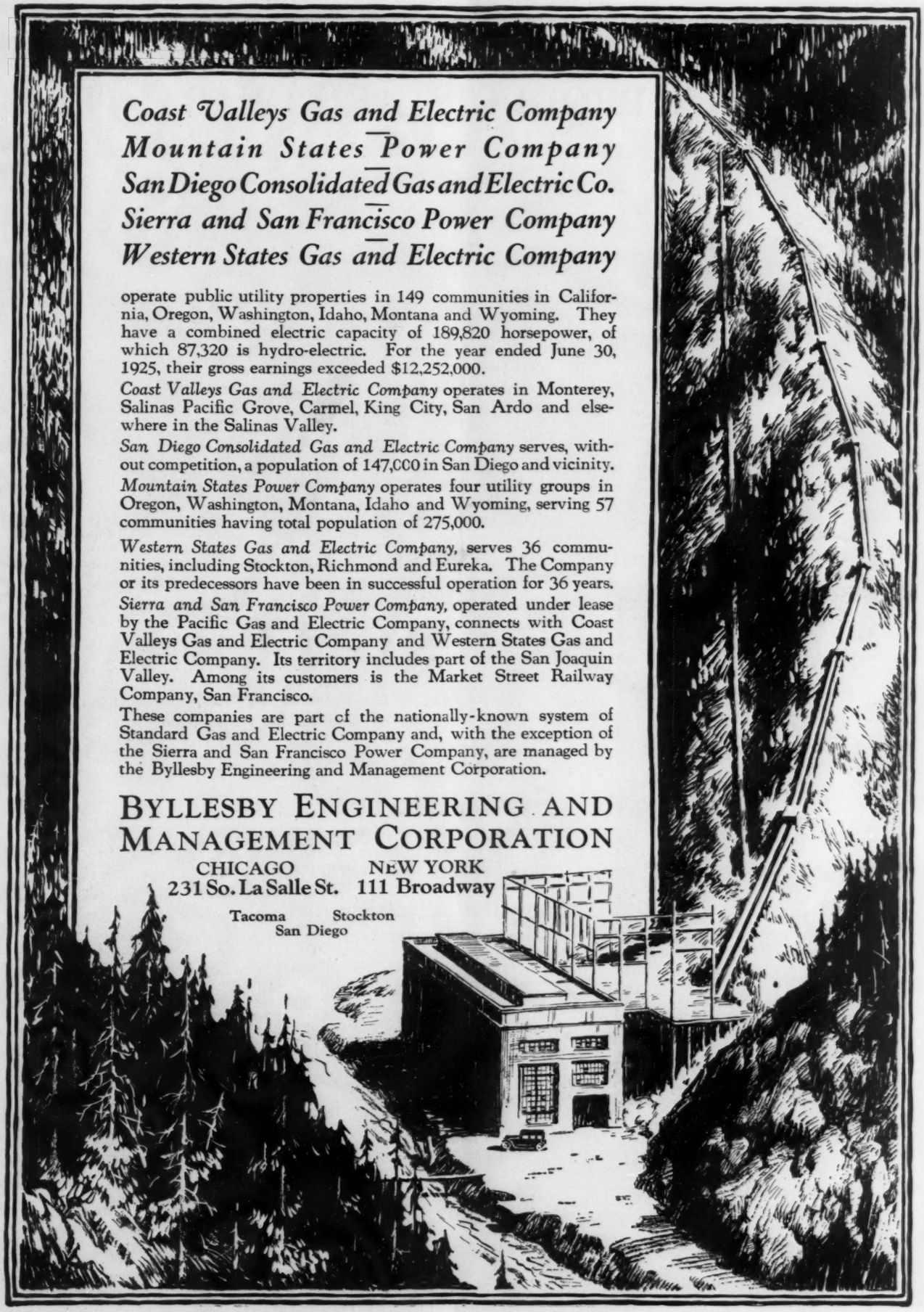
Sierra and San Francisco Power Company, operated under lease by the Pacific Gas and Electric Company, connects with Coast Valleys Gas and Electric Company and Western States Gas and Electric Company. Its territory includes part of the San Joaquin Valley. Among its customers is the Market Street Railway Company, San Francisco.

These companies are part of the nationally-known system of Standard Gas and Electric Company and, with the exception of the Sierra and San Francisco Power Company, are managed by the Byllesby Engineering and Management Corporation.

BYLLESBY ENGINEERING AND MANAGEMENT CORPORATION

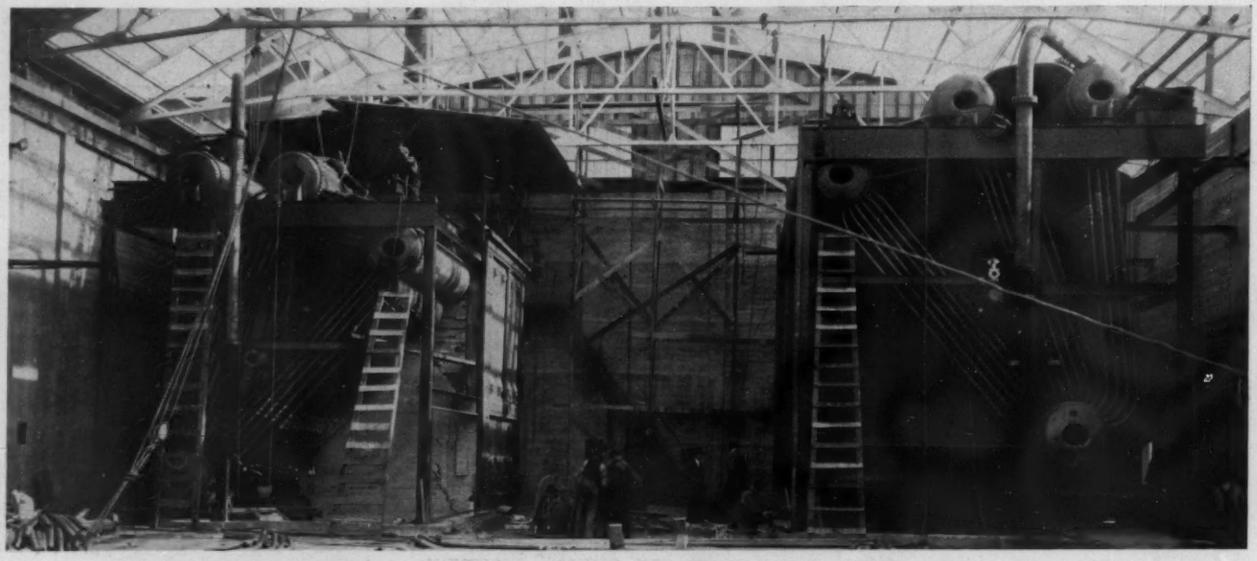
CHICAGO 231 So. La Salle St.
NEW YORK 111 Broadway

Tacoma Stockton
San Diego

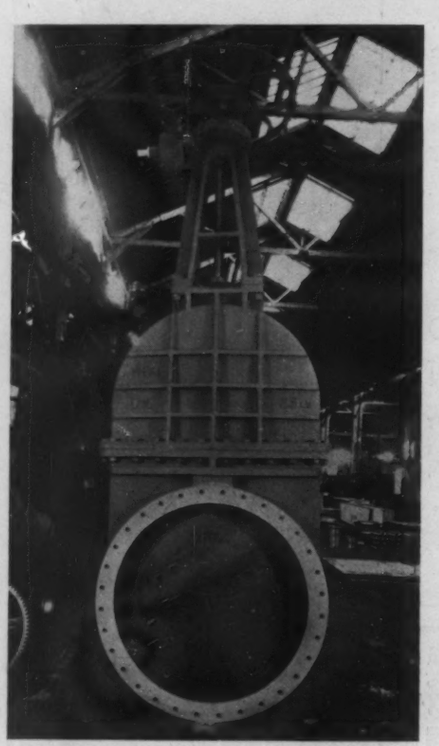


ABILITY EXPERIENCE SERVICE

LLEWELLYN PRODUCTS ARE GUARANTEED



TWO 1000 HORSEPOWER CONNELLY WATER TUBE BOILERS



HAND OR POWER OPERATING VALVES 16" TO 60"

VALVES

Suitable for
Water, Steam, Gas or Air

HIGH and LOW PRESSURE

BOILERS

Horizontal Return Tubular and Locomotive Types
Llewellyn Horizontal Water Tube
and
Connelly High Pressure Types

Structural Steel

Llewellyn Electric

Passenger and Freight Elevators

Traveling Cranes
Derricks
Hoists
Tanks

Pipe
Riveted or Cast Iron
Cast Iron or Cast Steel
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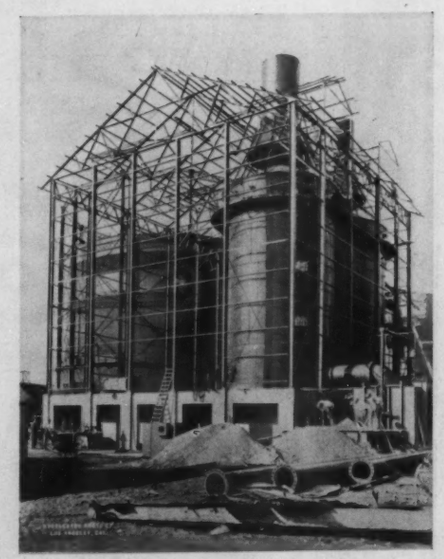
Plate Work
Foundry
Machine and Forge Shops



GAS GENERATING PLANTS

LLEWELLYN IRON WORKS LOS ANGELES, CAL.

The WHY of Studebaker In Public Service

ONE of the outstandings tributes to Studebaker in Southern California today is its privilege to be serving faithfully and consistently more than a score of public and semi-public utility organizations.

Studebaker was challenged to do big things for these organizations, directed by big men of exacting judgment. Proof that Studebaker has met that challenge successfully—that its cars have demonstrated their superiority and completeness—is found in the fact that a great many of these organizations have standardized on Studebaker cars for their transportation.

Such tremendous patronage must be merited. And the men in these organizations charged with securing the best in motor car transportation will tell you that it has been so with Studebaker. For the hundreds of Studebakers serving the organizations listed below have given the best evidence of actual stability by their unmatched performance under the most severe conditions that it is possible to create for a motor car.

Raw roads, mountain grades, sandy desert stretches, heavy pulls with strong loads that sometimes seem unreasonable—these are common for Studebakers. A daily duty well performed.

And these men will give you these reasons for standardizing on Studebakers—constant performance, thorough dependability, long life, tremendous reserve mileage, lack of upkeep cost, minimum gas and oil consumption, tire mileage, and their ability to give CONSTANT SERVICE under any conditions IN THE HANDS OF HUNDREDS OF DRIVERS.

When you want to know about Studebaker stability, visualize the range of service represented for these cars in the utility organizations listed below. Then ask us for further facts, remembering that Studebaker has no more yearly models.

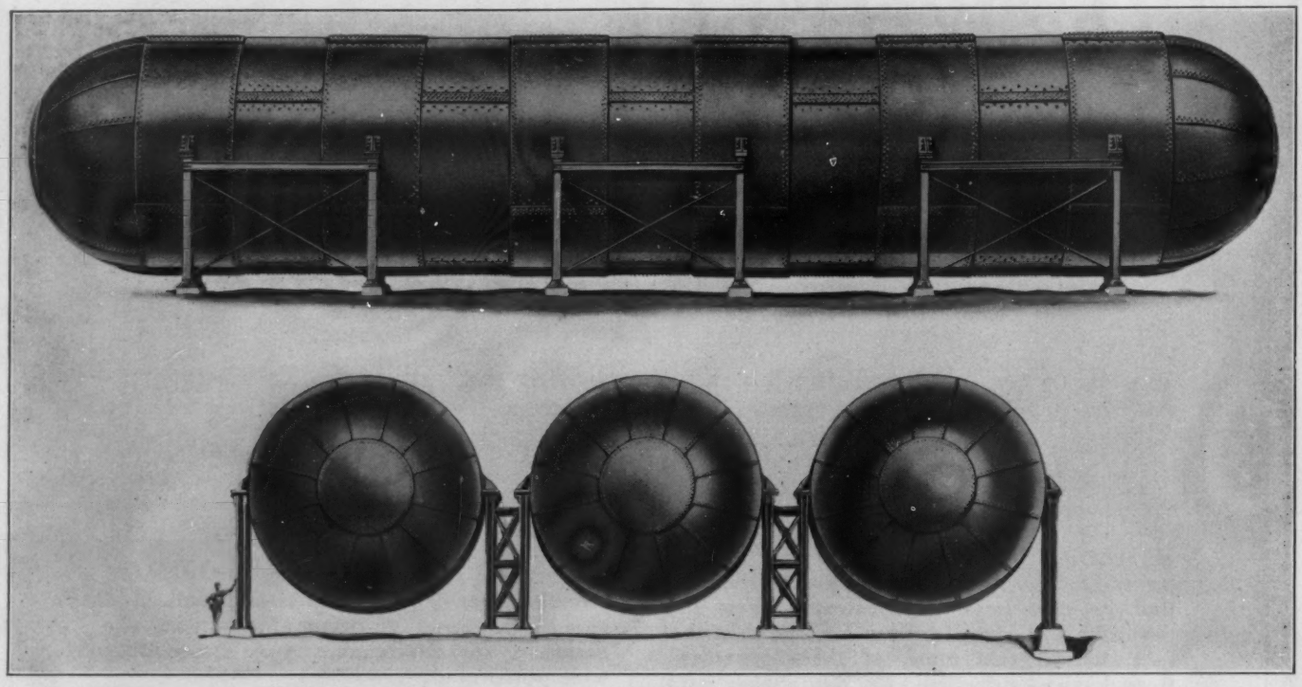
Southern Counties Gas Company
Southern California Edison Company
General Petroleum Corporation
Gilmore Oil Company
Pan American Petroleum Company
Southern California Telephone Company
Petroleum Midway Corporation
E. J. Miley, Oil Operator
Julian Petroleum Corporation
Richfield Oil Company
Shell Company of California
California National Supply Company
California Inspection Rating Bureau
Los Angeles Police Department
Los Angeles Fire Department
Los Angeles Bureau of Power and Light
Firemen's Fund Insurance Company
Auto Club of Southern California
Oil Well Equipment Company
Santa Catalina Island Company
Stillwell Auto Livery

PAUL G. HOFFMAN CO. INC.

STUDEBAKER DISTRIBUTORS

Figueroa at Pico 6116 Hollywood Blvd. 240 N. Market St., Inglewood

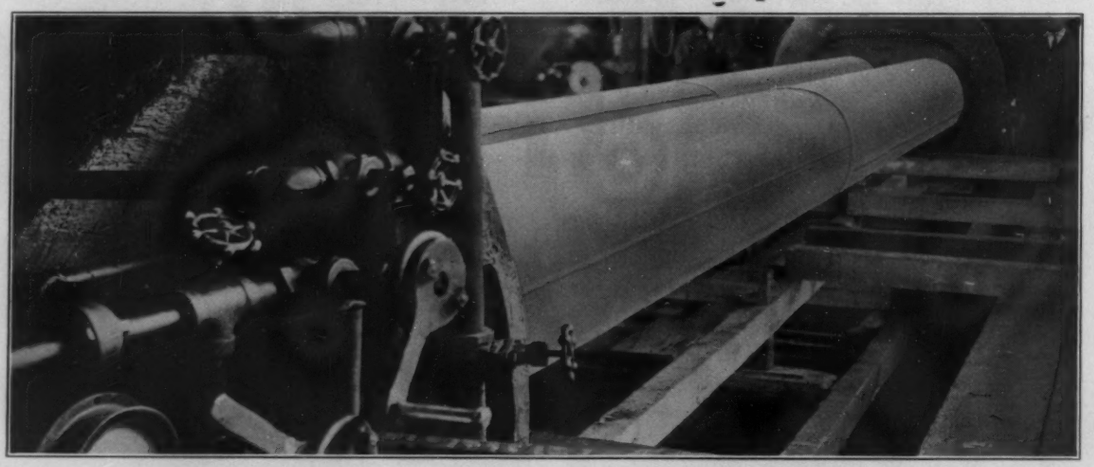
High Pressure Gas Holders



Above illustration shows three High Pressure Gas Holders being built by W. P. & S. for Southern Counties Gas Co. They have a net capacity of 76,400 cubic feet; working pressure 40 lbs. per square inch; inside diameter 20′ 1½″, length over all 107′ 9″.

WESTERN PIPE & STEEL LEADS THE WEST IN THE MANUFACTURE OF EQUIPMENT FOR GAS COMPANIES AND OTHER PUBLIC UTILITIES

Automatic Electric Welded Pipe



This view shows two sections of 24″ x 3/16″ automatic electric welded pipe on the testing machine. W. P. & S. is fabricating 22 miles of this pipe, which is dipped and soil-proofed, for a municipal water line.

Western Pipe & Steel Company
OF CALIFORNIA

444 Market Street
San Francisco

5717 Santa Fe Avenue
Los Angeles

Factories: Los Angeles — South San Francisco — Fresno — Taft — Phoenix

Rarin' to Go!

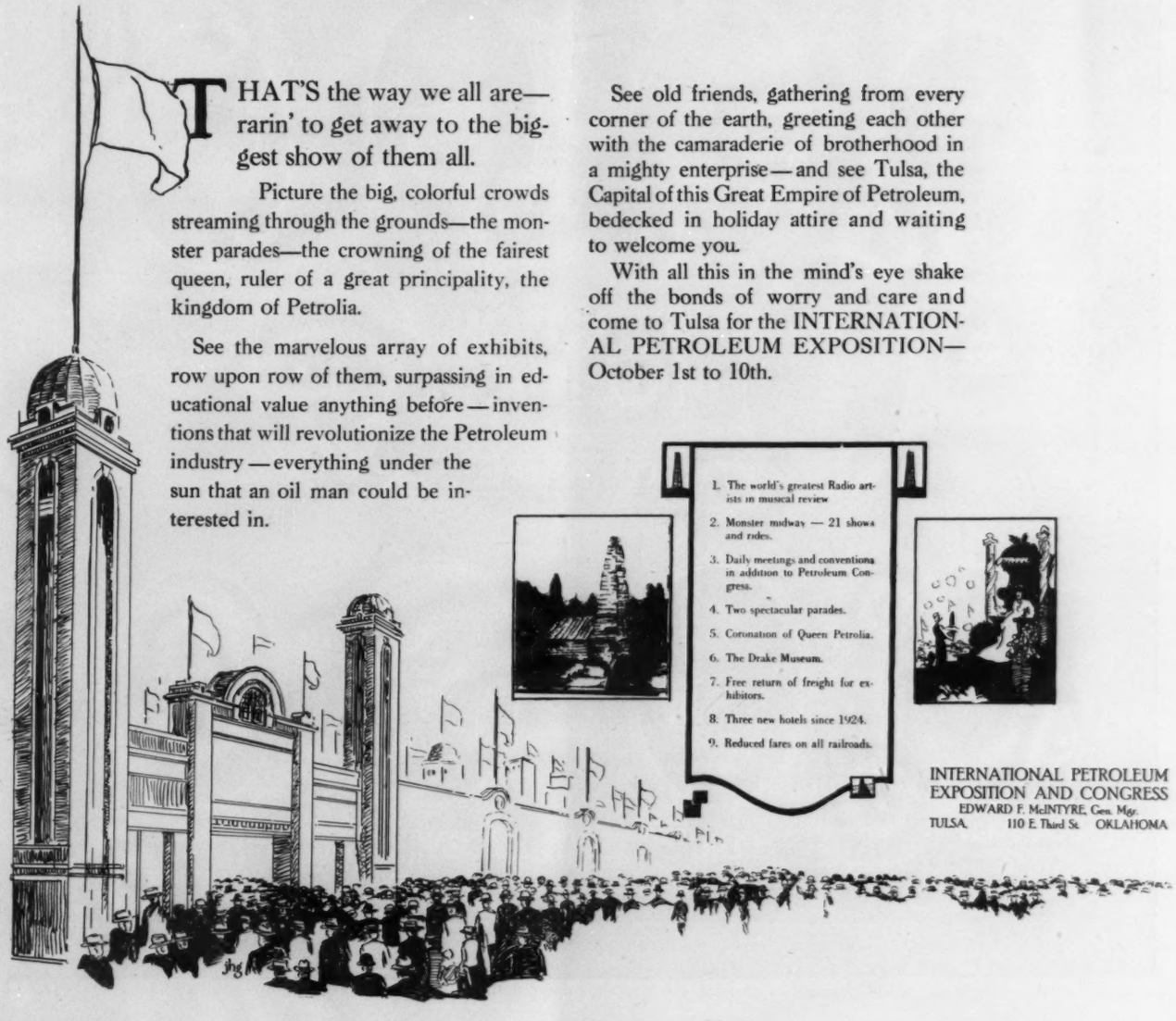
THAT'S the way we all are—rarin' to get away to the biggest show of them all.

Picture the big, colorful crowds streaming through the grounds—the monster parades—the crowning of the fairest queen, ruler of a great principality, the kingdom of Petrolia.

See the marvelous array of exhibits, row upon row of them, surpassing in educational value anything before — inventions that will revolutionize the Petroleum industry — everything under the sun that an oil man could be interested in.

See old friends, gathering from every corner of the earth, greeting each other with the camaraderie of brotherhood in a mighty enterprise — and see Tulsa, the Capital of this Great Empire of Petroleum, bedecked in holiday attire and waiting to welcome you.

With all this in the mind's eye shake off the bonds of worry and care and come to Tulsa for the INTERNATIONAL PETROLEUM EXPOSITION—October 1st to 10th.



1. The world's greatest Radio artists in musical review
2. Monster midway — 21 shows and rides.
3. Daily meetings and conventions in addition to Petroleum Congress.
4. Two spectacular parades.
5. Coronation of Queen Petrolia.
6. The Drake Museum.
7. Free return of freight for exhibitors.
8. Three new hotels since 1924.
9. Reduced fares on all railroads.

INTERNATIONAL PETROLEUM EXPOSITION AND CONGRESS
EDWARD F. McINTYRE, Gen. Mgr.
TULSA 110 E. Third St. OKLAHOMA

1924-25 OFFICERS
Pacific Coast Gas Association
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PRESIDENT
F·J·SCHAFER
VICE-PRESIDENT
D.G.MARTIN
TREASURER
CLIFFORD JOHNSTONE
EXECUTIVE SECRETARY
W S YARD
CHAIRMAN
TECHNICAL
SECTION
H.R.BASFORD
A.B.DAY
GEO. E. WHITWELL
CHAIRMAN
COMMERCIAL
SECTION
ASSOCIATION
DIRECTORS
J.E.KELLEY
H.M.CRAWFORD
DON C. RAY
CHAIRMAN
PUBLIC RELATIONS
SECTION
C.W.PLATT
CHAIRMAN
ACCOUNTING
SECTION
COMMITTEE CHAIRMEN
R.M.RANYARD
CHAIRMAN
COMMITTEE ON
MEMBERSHIP
GEO.L.MEYERS
CHAIRMAN
COMMITTEE ON
ARRANGEMENTS

WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in the *Eleven Western States*

How *the* Association *is* Serving Dealers

The Dealer in Gas Appliances Has a Place of Growing Importance in the Life of the Pacific Coast Gas Association

By E. L. HALL, *President*
Pacific Coast Gas Association

THE thirty-second annual convention of the Pacific Coast Gas Association will meet in Portland, Oregon, on August 17th. *Western Gas* has kindly offered the Association an opportunity to extend an invitation through its columns to the many readers of our new Pacific Coast gas journal, an opportunity which is very heartily welcomed, because there has heretofore been no means whereby the gas industry on the Coast could broadcast its message to the great army of merchandizers in gas appliances. It is to these business men especially that this message is addressed. It will be an attempt to outline briefly what the Pacific Coast Gas Association means to the dealer in appliances on the Pacific Coast and what we are attempting to accomplish this year, to solve a few of the problems with which the dealer is confronted.

SEVERAL Association projects now under way, as described in President Hall's message, should do much to raise the standard of the appliance merchandising business. To quote from the article: ". . . a great effort has been made to make the Association a clearing house for discussion and constructive efforts along advertising and merchandising lines. . . . research and standardization regarding the utilization of gas . . . will undoubtedly lead to a great betterment in the character of appliances which will be sold hereafter, and improved standards of installation."

Dealer is Vital Factor

It is a regrettable fact, but nevertheless true, that the Association in the past has not done very much for the commercial man, and practically nothing for the dealer. This condition is, however, readily understood when it is remembered that the Association came into existence purely as a means for the engineers of the gas companies to get together for the discussion of technical problems. During the last two or three years, progressive forces have been at work in the Association, resulting in a great impetus for constructive effort regarding all phases of the industry. The key note has been specialization applied in systematic manner and with a comprehensive scope. In other words, the problems of the industry have been logically classified, and the men interested in similar problems have been grouped into committees for the study of these subjects, and the old day of the individual expression of opinion has largely been superseded by co-operative efforts to arrive at a concensus of opinion as to what constitutes the latest and most improved practices relative to the art.

Association Service Growing

Such a schematic effort could not ignore the commercial phases of the industry. Under the able leadership of such men as Basford, Galbraith, Ray, Crawford and Whitwell, as officers and chairmen of commercial committees, a great effort has been made to make the Association a real clearing house for discussion and constructive efforts along advertising and merchandising lines. Last but not least, publicity and selling and merchandising have been accompanied by brilliant and constructive research and standardization regarding the utilization of gas for domestic and industrial purposes, which will undoubtedly lead to a great betterment in the character of appliances which will be sold hereafter, and improved standards of installation.

Unfortunately, the progress of the gas industry has been largely one of local effort. There have been lacking national manufacturers with such splendidly equipped research laboratories as have made possible the astounding development of the electrical appliance industry. There has also been lacking for the same reason a nation-wide propaganda designed to educate the consumer to the advantages of gas and to create the desire which opens up the door for the dealer in appliances. Lacking such agencies for development, is it not all the more reasonable that the industry must co-operate through the Associations such as the American Gas Association and the Pacific Coast Gas Association?

A realization of these facts, I am glad to say, is becoming manifest in all sections of the country, but more particularly on the Pacific Coast.

A Testing Laboratory

Among the national co-operative movements of great interest to the merchandisers of gas appliances may be mentioned the great appliance testing laboratory now being placed in commission by the American Gas Association. In passing—the Pacific Coast may take pride in the fact that a Portland man, R. M. Conner, has been chosen to head this laboratory.

The national Association is also undertaking, through a special committee, a study of the appliance specifications according to which standards the testing laboratory will rate all appliances submitted for examination. One cannot help but become enthused regarding the great progress of the industry which will be made possible by the rapid development of appliances that is sure to follow such a constructive program.

Better appliances, safer appliances, more convenient appliances, will double and triple the sales of the many agencies now merchandising gas apparatus for the home, restaurant and the factory. At the same time, these efforts will be accompanied by national publicity on a tremendous scale, for which large appropriations have already been made by the American Gas Association.

Local Accomplishments

Turning to our own Association on the Pacific Coast, we find constructive and valuable achievements during the last two or three years. Taking the same in the order of their occurrence, we find one of the most noteworthy in its ultimate benefit to the appliance dealer has been the development of a Testing Code, describing the methods by which the efficiency and safety of gas appliances can be ascertained in the laboratory, thereby enabling the manufacturers and gas companies and others interested in these matters, to arrive at uniform and precise findings concerning the merits of appliances and the various burners thereof. While such scientific and possibly somewhat theoretical matters do not seem to immediately affect the appliance dealer, yet it will be recognized by all of those who have had to do with the design and manufacture of appliances that the satisfactory operation of the same is largely the product of efficient laboratory testing methods. Of course the merchandiser will soon benefit from the superior character of appliances which will result from such investigations.

Sales Methods Evolved

Those familiar with the convention of a year ago held at Santa Barbara and that of the previous year, held at Del Monte, cannot have failed to have been impressed by the valuable and constructive advertising and sales methods presented at these meetings. Perhaps one cannot classify the development of enthusiasm as a tangible accomplishment; yet who can deny that tremendous sales stimulus must have been given to the gas industry as the result of the confidence and enthusiasm engendered by the masterly presentations of such men as Mr. Crane and others prominent in our merchandising world.

During the present year a situation has arisen on the Pacific Coast fraught with considerable danger to the industry because of public resentment concerning certain hazards due to the use of gas emanating from faulty installations and occasionally from poorly designed appliances. Reputable dealers everywhere became alarmed and voiced their resentment. Even the municipalities in several of the Pacific Coast cities were impelled to give the situation earnest attention in order to correct such conditions that crept into the industry through an unregulated growth.

Model Ordinance Prepared

The Association stepped into this breach in time to quiet public apprehension, and to sponsor future regulation of the character of appliances to be merchandized on the Pacific Coast. The first of these constructive efforts was toward a survey of existing ordinances and regulations for the installation of gas appliances, throughout the United States. By such a survey it was possible to select such rules and regulations as would properly protect the public and yet be acceptable to the industry. When the committee in charge of this work reviewed the many ordinances in effect throughout the United States, there was revealed an amazing lack of uniformity and effective regulation. It was apparent that many of the regulations passed had been virtually copied from existing regulations elsewhere with little or no effort to ascertain their safety or reasonableness. As a result of this study, a model ordinance was prepared by the Association, which comprises a number of rules and regulations, all of which are reasonable and useful. This model ordinance was submitted for criticism to many men prominent in the Pacific Coast industry and further modified as a result of such criticism. In its final shape it has already served for a new regulatory ordinance for the city of Los Angeles. Several other cities on the Pacific Coast are using the model ordinance as a basis for local legislation.

Appliance Certification Plan

The Association is at present elaborating a plan whereby appliances can be certified temporarily as to their safety and general desirability from the public view-point in order that the legislation now being almost universally enacted in our Coast cities may have some criticism for weeding out dangerous and undesirable appliances. The plan is offered as a temporary measure until such a time as the American Gas Association Appliance Testing Laboratory shall have passed in an authoritative manner upon the qualifications of all gas appliances now being manufactured. It is hoped that very shortly the Association will thus be able in an impartial and unprejudiced manner to weed out a very few appliances which have been a thorn in the side of the reputable dealer and the gas companies.

An Appliance Manual

Possibly the most interesting feature to the appliance dealer is a manual which is in course of preparation by the Association, which will be practically a text book on the proper selection, installation, maintenance, and demonstration of gas appliances. There is nothing of this kind available in such a comprehensive form. It should prove a veritable boon to the appliance dealer who is primarily a business man, but not technically versed in the utilization of gas, yet who is nevertheless desirous of having his customers thoroughly satisfied by safe and workmanlike installations. It is hoped that the manual will serve somewhat as a text book for the fitter and others engaged in the actual installation work. It is hoped to have this manual in shape to distribute shortly after the forthcoming convention at Portland, where the manual will be presented in its final form for adoption.

One might be tempted to elaborate further concerning the value of the Association to the merchandisers of appliances, but surely enough has already been indicated to warrant their full and enthusiastic support for the dissemination of up-to-date selling methods and scientific service.

A Personal Question

To the appliance dealer who reads these words may come the thought "How does this affect me personally? Can I afford to join the Pacific Coast Gas Association in order to realize the benefits from these constructive efforts?"

To those engaged exclusively in the merchandising of gas appliances, the writer would say—"By all means, you cannot afford to absent yourself from these gatherings of gas men, if you expect to merchandise your wares to the best advantage." To those with whom the merchandizing of gas appliances is only incidental it is possible that the time and effort of attending such gatherings might seem unduly irksome, and the subject of gas utilization too much of a study to undertake in connection with many other business problems. To such I would say—"At any rate join your local gas appliance society. There you will find men who like yourself are merchandisers of more than gas appliances. They have your viewpoint. You will find them friendly and helpful. You will also meet at these gatherings men whose entire efforts are given to promoting and selling gas and gas appliances, and the opportunity of meeting such men and of deriving helpful inspiration from their knowledge of the gas business should not be overlooked."

Come to Portland!

To one and all the Association issues a most hearty invitation to attend the various conventions and meetings of the gas men of the Pacific Coast—it pays.

The meeting in Portland, to be held August 17th, is a convention of particular interest to the appliance men because of a program largely devoted to matters of utilization and sales promotion.

Representative Papers Prepared *for* Portland Convention---*in* Abstract Form

Studies *in* Pipe Corrosion *and* Protection

A Paper by H. S. CHRISTOPHER
Southern California Gas Company

CORROSION of pipe in the ground is responsible for tremendous loss in capital. The necessity for continual replacement of corroded mains and service pipes affects alike the gas, water, and oil industries, all of which are tremendous consumers of both welded and wrought iron pipe, and jointly interested in means for securing extension in pipe life. During 1924, the value of pipe lost through corrosion in the United States totalled approximately twenty millions of dollars. Considerations of economy involve employment of various kinds of protective coatings that should be selected in such a manner as to utilize individual qualities to best advantage.

H. S. Christopher

To secure information on which to base selection of suitable protective coatings, reports of underground pipe inspection, which are designated with the specific ends in view of supplying diversified information regarding corrosion phenomena, may be employed advantageously. In addition to supplying data regarding the general distribution of soil conditions, useful figures on pipe life and expectancy may be derived.

Computing Corrosion

Corrosion being assumed to proceed in a uniform manner through the pipe wall, one may compute the probable life of the pipe if its age at the time of inspection is known, in addition to its wall thickness and the percentage deterioration. With a knowledge of the total life of pipes in different sizes, one may compute the life of a standard pipe which has been arbitrarily defined as a 3½-inch steel pipe with a wall thickness of 0.226 inches. The rate of deterioration of the standard pipe under various soil conditions furnishes a means for comparing their corrosive powers.

Systematic inspection of pipes throughout the operating territory of the Southern California Gas Company discloses the existence of three distinct kinds of corrosion, of which pitting is the most widespread in this system. Severe pitting of pipe has been observed to occur frequently in the absence of electrolysis conditions. Indications have been secured that large sized pipes are more resistant to corrosion than are pipes in smaller sizes.

"Ionization Potential"

Chemical analyses of soil do not suffice to determine their corrosive power. Though rate of deterioration of the arbitrarily defined "standard" or 3½-inch steel pipe may be employed for the purpose, the unique "ionization potential" measurement offers a far more convenient way to test corrosive power; with two storage batteries, and a charger, twelve tests may be run at one time, 96 hours being required to complete the determination.

Knowing the rate of deterioration of several different kinds of protective coatings under know soil conditions, in addition to cost figures, one may calculate "availability" numbers for each coating. The coating with the highest "availability" number for any particular soil condition is best adapted for use in that soil.

Continued progress toward reduction and final elimination of the uncertainty involved in selecting protective coatings hinges upon accurately determining the period of time in which coating will effectually protect pipe from corrosion under known soil condition. To secure such data, a practicable substitute for the element of time involved in the deterioration should be devised, and service conditions simulated as closely as possible in accelerated tests of stability.

SPACE would not permit the publication of abstracts of all papers which will come before the 1925 Convention of the Pacific Coast Gas Association at Portland, even if all were available. But WESTERN GAS takes occasion, in presenting the several accompanying reviews of papers and reports, to whet the appetites of those Convention-bound—and to engender in them who to date have not made Convention reservations a keen desire to hear at first-hand these, and other Convention offerings.

A Report *on* Prevention *of* Accidents; First Aid

V. R. HUGHES, *Chairman,*
Pacific Gas & Electric Company

THIS report on accident prevention and first aid presents a brief outline of an effective workmen's accident prevention plan, the first section of the report dealing with company organization for accident prevention.

V. R. Hughes

The report advocates the forming of Central Safety Committees within each company, each committee to consist of three to four executives representing the management and the operating and construction departments. This committee should have general supervision over the plan's operation, should hold monthly meetings to hear the secretary's report of accidents occurring since the previous meeting and should devise and make effective changes in the plan. The committee should award prizes where such are used.

A Safety Director should periodically inspect company properties and recommend safety devices. The Director should also hold meetings with workmen.

Local Safety Committees

Each division or district should have a Local Safety Committee, not to exceed three in number, each member serving for three months and holding the chairmanship for the last month of service, these provisions tending to promote the educational effect of the committee work. All safety reports should be submitted to the Central Safety Committee at definite times. Local committees should not have power of enforcement of recommendations. This power should rest with the superintendent or foreman, if the recommendations are judged to be wise.

Safety Bulletins

The use of Safety Bulletins is highly recommended in the report. They should be replete in illustrations, issued regularly, and posted in conspicuous places.

A pocket-size Safety Code, incorporat-

ing a few fundamental safety rules and first aid instructions, and perhaps stating penalties for breach of regulations, is also advocated.

The practice of teaching first aid to workmen is commended. Company doctors should attend classes occasionally to assist in the instruction being given.

Essentials of First Aid

Simplicity should be stressed in first aid instruction, and such instruction should aim toward familiarizing workmen with treatment for shock, hemorrhage, asphyxiation, and with safe methods of transportation for the injured. United States Bureau of Mines methods are recommended; the demonstrational manner of teaching, supplemented by lecture and practice, is approved; team contests are pointed out as useful.

First aid kits should be placed on trucks and at strategic points of operation, and use of their contents should be taught in classes.

Periodical examinations of employees, including eye tests, should be made.

Oil Gas Manufacturing Sub-Committee's Report

JAMES M. DICKEY, *Chairman*
Pacific Gas and Electric Company

THE steady increase in price of fuel oil is being watched with concern by the oil gas industry. The price has increased from 68 cents in 1915 to $1.58 in May 1925, an increase of over 100 per cent. With another 100 per cent increase in the next 10 years, the price of gas oil will be $3.16 in 1935; and the holder cost of the gas will be greater than the present cost of gas delivered at the consumer's meter.

James M. Dickey

Fuel oil is no longer a cheap by-product of the refineries, for it is now possible to convert practically all of it into motor fuel and lubricants, for which there is a steadily increasing demand. The U. S. Geological Survey figures show that from 1914 to 1924 the consumption of oil in the United States has increased 180 per cent, and the production about 12 per cent less. Our present available supply of crude petroleum in the ground is estimated to be only about nine billion barrels, and we are using it now at the rate of three-fourths of a billion barrels a year.

Many improvements have been made in manufacturing apparatus and in methods of manufacturing oil gas; others are being developed. Among some of the more important improvements may be mentioned the following:

Beehive arches have been installed in the upper primary of the larger two-shell generators, replacing the corbel arches formerly used. This has given a larger combustion chamber in the same height of shell and increased the heating rate. In a 15-foot generator, this one change increased combustion, in gallons per minute, more than 30 per cent. Beehive arches have been used in the smaller generating units for some time past, but only recently have they been built into the larger two-shell units.

The area of the stack opening has been reduced 23 per cent in the 18 ft.-9 in. two-shell generators. This has resulted in a much more uniform heat distribution throughout the entire unit.

Blast piping has been enlarged; larger air blowers of greater capacity at higher pressure have been installed. With the larger piping and blowers driven by variable speed motive power, it is possible to have exactly the right blast volume and pressure to handle the generator no matter what the conditions.

Higher Temperatures

Work is being carried on toward the development of higher temperatures for the make oil. Theoretically and in actual practice, it can be seen that there are considerable possibilities for additional efficiencies along this line. Raise the temperature of the make oil to 700° F. before spraying it into the generator and a large percentage of the work previously done by the checker brick will have been accomplished outside of the generator.

Waste heat boilers have been developed for the single shot generators in the south. By operation of two generators to one boiler, it is possible to develop 377 continuous boiler horse power from the stack gases of each of the 18 ft.-9 in. two-shell machines, or 754 H. P. from each pair of generators. When these are installed, a considerable saving will be effected in generating costs.

All the improvements mentioned will increase manufacturing efficiencies; other improvements may develop and result in additional economies. However, with all the possible manufacturing improvements, it will be difficult to keep pace with the oil situation as it is developing and will continue to develop in the immediate future.

Coal Available

The situation would be more discouraging if it were not for the fact that preliminary surveys have indicated that there is available upon the Pacific Coast large quantities of coal suitable for gas manufacture. One company is already using this Western coal for gas making, and another company is carrying on intensive research work to determine what type of gas generating process is most suitable for handling the lignite and subbituminous coals found in the Pacific Coast states.

An Improved Oil Spray *and* Burner *for* Generators

A Paper by J. E. KELLEY, C. G. FISCUS, J. T. LEARY, W. P. SNYDER
Western States Gas & Electric Company

AS a result of the report made in 1923 by Mr. Yard, chairman of the Pacific Coast Gas Association's Subcommittee on generator design, in which he called attention to the lack of information on oil burners and sprays, and the more recent request of several other California companies for research on this subject, the Western States Gas & Electric Company has conducted an extensive series of tests to determine the characteristics of the various sprays and burners in use.

J. E. Kelley

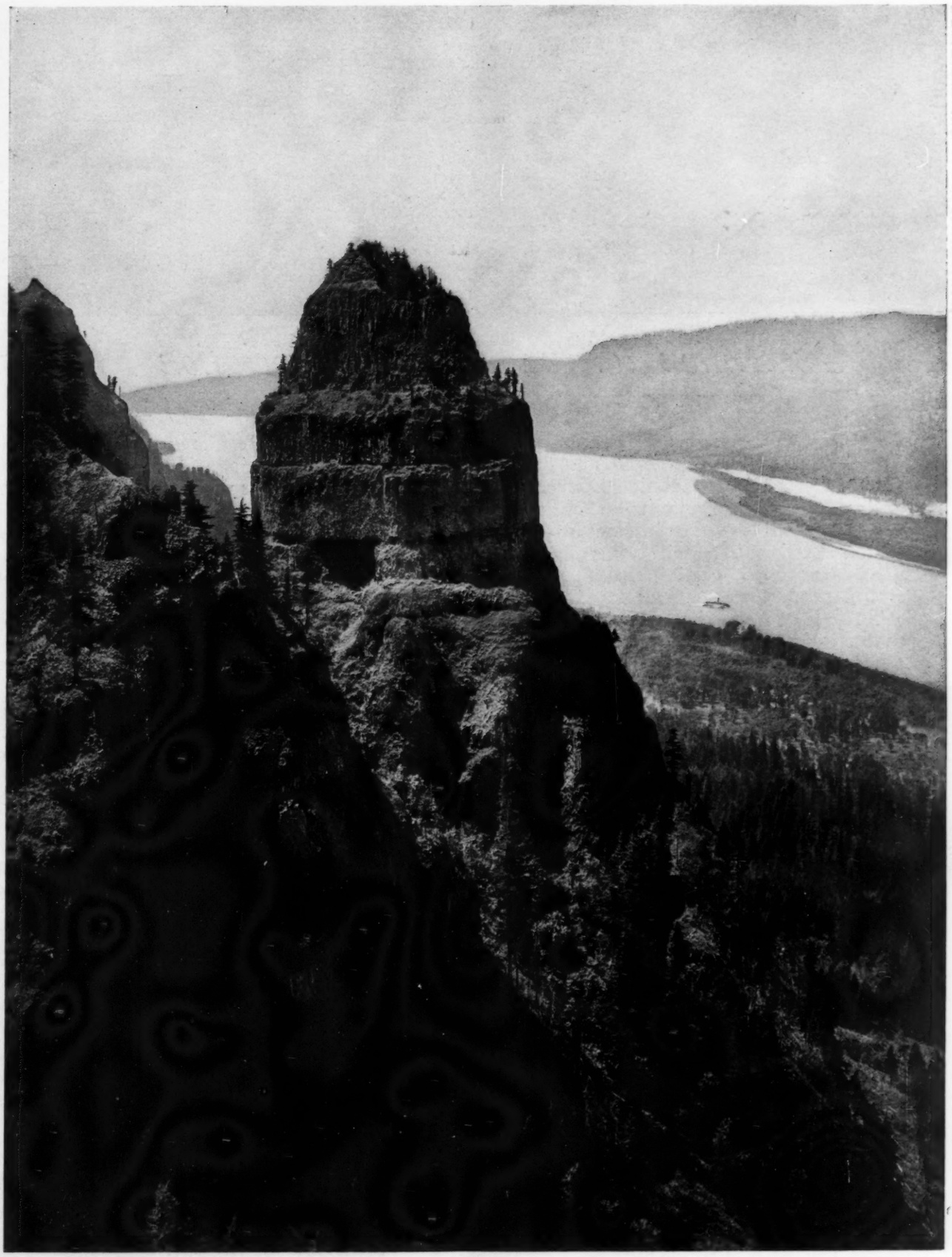
The tests were made by spraying the oil into a tank 20 feet in diameter. The steam and oil were metered, and the pressure regulated as close as possible to the actual operating conditions for each burner and spray. The results of the tests indicate pretty definitely that good atomization is very rarely secured with most of the present burners and sprays. In many tests the oil shot across the tank in a solid stream; in other tests, the oil dribbled out of the end of the tip.

The spray used by the Sacramento plant of the Pacific Gas & Electric Company showed distinctly better atomization than any other spray that had been tested, and the construction of it made us believe that better mixing of the oil and steam was secured in this spray. Further investigtaion of various devices which might produce a better mixture of oil and steam resulted in the development of the Snyder atomizer, which was tried out with several types of tips with very good results. The new atomizer was finally tried out in a spray tip which had the special atomizing feature of the Sacramento burner, and this combination produced a spray which, judged by visual observation, showed better atomization and distribution of the oil than any other spray or burner that had been tested.

The improved spray has been in use in one generator for five months without

(*Continued on Page* 29)

ST. PETER'S DOME, SCENIC LANDMARK NEAR PORTLAND, ORE.



Convention Views Reveal Association Progress--

1924 Convention Contrasted with Convention of 1893

THE two views shown on these pages might be said to represent the Alpha and Omega of Pacific Coast Gas Association Convention history to date. The panorama at the top, showing last year's delegates gathered in front of the Arlington Hotel, Santa Barbara, will bring pleasant recollections to many who participated in that highly successful conference.

The view at the bottom pictures an occasion shared in by only a few figures now active in western gas circles. This photograph of the first of Association Conventions, taken at the North Beach Station, San Francisco, on July 12, 1893, represents the entire charter membership of the Association in its first year of existence. A survey of those present reveals many a leader, and to follow the development of these personalities is equivalent to following the course of the gas industry's rapid advance in the west.

It is a far cry from the 1893 Convention to the present stage of Association enterprise. In its formative period the motivating reason for the Association was the desire to create an open forum for the exchange of engineering problems and solutions. Today the Association's activities are as wide as the industry itself.

August 17 to 21 will add another picture to the growing gallery of Convention views. It remains to make this picture the most representative panorama of western gas industry personnel ever taken. In regard to the Portland Convention Clifford Johnstone, executive secretary of the Association, issues the following invitation through *Western Gas*:

A Word About the "Conversazione"

"Are you going to the Portland Convention?" is an inquiry I have been frequently making during the past few weeks. The invariable answer has been "I don't know, ask the Boss." In consequence I have asked many "Bosses", the question usually taking the form, "How many men are you planning to send to the Convention this year?" The reply comes

ASSOCIATION MEMBERSHIP IN 1893

* Past Presidents of the Association
‡ Known to be deceased

Front row left to right (seated):
Robert P. Greer, Pres. Pacific Ammonia and Chemical Company.
J. L. Hallet, Manager Portland Gas Company, Oregon.
‡Wm. G. Barrett, Secretary San Francisco Gas Light Company.
**E. C. Jones, Assistant Engineer San Francisco Gas Light Co.
‡*Joseph B. Crockett, Pres.-Engineer, San Francisco Gas Light Co.
‡*F. H. Eichbaum, Eng., Pacific Gas Improvement Co., San Francisco.
J. C. Pierson, Supt. Capital Gas Company, Sacramento, California.
‡John L. Stewart, 1st Pres. United Gas Imp. Co., Philadelphia.
‡J. E. Gannon, City Gas Inspector, San Francisco.
‡Wm. Toomey, Storekeeper, San Francisco Gas Light Co.

Second Row Standing:
‡Wm. Dunbar, Mason, Const. North Beach Station, San Francisco.
‡Sidney B. Cushing, Pres. San Rafael Gas & Elec. Light Co., Calif.
‡*Henry E. Adams, Supt. Stockton Gas, Light & Heat Co., Calif.
W. S. Wharton, Supt. Bellingham Bay Gas Co., Fairhaven, Wash.
A. J. Vanderwhite, Supt. North Beach Sta., S. F. Gas Light Co.
J. W. Thomas, Supt. Vallejo Gas Light Co., Calif.
(Young Boy), Mr. Eichbaum's son.

--Portland Panorama Will Represent Entire West

Indications Point to Record Attendance at Portland

back in two ways, either "All the traffic will bear", or, "All who can be spared", both of which are eminently satisfactory to a hard-working secretary who believes that this Convention is going to be a jim-dandy.

The chief appeal of a convention does not lie in the business program, nor in the reading of papers and reports, nor yet in the golf, the drives, the dinners or the dances. These are merely the roast beef, the trimmings and the dessert—the appeal lies in those present. It would be a poor association that had no members and it would be a bum convention that had no delegates.

A convention should not be called a convention at all,—it should be called an "Inspirational, Revivalistic Conversazione", meaning that it is a meeting at which, through conversation with our peers, we revive those ideals which have become sadly frayed by a winter's peak load, and derive inspiration to carry on through another one. "Convention," however, is a bit shorter and is not such a bad word at that, as it means "Conversation Vent Place." Let there be complete combustion of all our problems!

So when I say that at Portland fifty-seven committees will submit reports and papers telling what has been accomplished by 258 committeemen in a year's work, I am offering nothing but brain food. When I say that there will be a drive over the Columbia Highway to the snowfields of Mt. Hood, a boat ride on the Columbia River, with dances and golf thrown in at every opportunity, I am tickling your palate with ice cream and cake. But when I say (as I can if those Bosses haven't lied to me) that every available gas man west of the Rocky Mountains will be there for you to talk to, I give you the real, all-impelling reason for wanting to be there too.

I know you'll be there if you are human, providing, of course, that your Boss is human too. And don't forget that the wife and kids are also invited.

Clifford Johnstone

John Kempf, Jr., Mgr. Salt Lake & Ogden Gas & Elec. Light Co., Utah
‡M. Wylie, Supt. Carson City Coal Gas Company, Nevada.
G. I. Kinney, Supt. San Diego Gas & Electric Light Co., Calif.
Thos. Brooks, Manufacturers Agent, San Francisco.

Third and Fourth Row Standing, left to right in sequence:

*John Clements, Supt. Red Bluff Gas & Electric Light Co., Calif.
*M. C. Osborn, Supt. Virginia City Gas Company, Nevada.
‡Ph. Meyer, Welsbach Company, San Francisco.
‡O. M. Gregory, Supt. San Jose Light & Power Co., California.
Richard Fenner, Asst. Eng. San Francisco Gas Light Co., Calif.
‡*C. W. Quilty, Pres. San Jose Light & Power Company.
‡George Thompson, Eureka Foundry, San Francisco, (rear).
George D. Roper, Van Wie Gas Stove Co., Rockford, Ill.
*John Martin, Agt. for Cast Iron Pipe, San Francisco, (rear).
W. F. Boardman, Gas Stove Agent, San Francisco.
‡C. M. Converse, Supt. Potrero Sta., S. F. Gas Light Co., Cal. (rear.)
‡M. G. Elmore, Consulting Gas Engineer, San Francisco.
E. P. Grant, Supt. Modesto Gas Light, Coal & Coke Co., Cal. (rear.)
‡Samuel Guthrie, Supt. Pacific Gas Improvement Co., San Francisco.
‡John S. Kaneen, Supt. San Rafael Gas & Elec. Co., San Rafael, Calif.
‡Theodore R. Parker, Supt. Napa City Gas Light & Heat. Co., Calif.

SCENES ALONG THE COLUMBIA RIVER, NEAR PORTLAND, OREGON

Convention Papers *in* Abstract Form

(*Continued from Page 24*)

repairs or replacements. The carbon deposited on the top of the checkers has been less, and the brick appear to be in better condition than would ordinarily be expected. Although we are not prepared to make any special claim for better oil efficiency from the use of these sprays, we are of the opinion that when our figures are carefully analyzed these will show that there is a saving with the new sprays.

During the next year we expect to have more definite data on the saving in oil, the increase in life of brick, and the other advantages which we expect to secure from these improved sprays. For the present, we are very well satisfied with their performance, and hope that some of the other companies may find it convenient to give them a trial.

Prevention *of* Corrosion *of* Underground Piping

A Paper by DOZIER FINLEY
The Paraffine Companies, Inc.

REGARDLESS of the theories of corrosion, of which there are at least three, it is patent that there can be no corrosion of iron or steel if access of corrosive agents is definitely cut off from the metal. In the case of underground piping this nominally means if the pipe can be kept from contact with the ground water. The problem of pipe protection then becomes simply one of water-proofing.

Dozier Finley

Materials Tested

In order to determine how thoroughly the purpose of moisture exclusion is accomplished by materials commercially available on the Pacific Coast, tests were made embracing the following materials, some of which, however, are included for comparison purposes only:

1. Bituminous paint with red lead primer.
2. Tar paint, one coat.
3. Tar paint, two coats.
4. Asphalt dipped pipe.
5. Mechanically applied pipe covering having a felt base, with priming coat containing 2 per cent of zinc chromate.
6. Same as No. 5 except that the primer contained no zinc chromate.
7. Same as No. 6 except that a double wrapping of the same width covering was used.
8. Same as No. 7 except that a special covering was used—one designed particularly for hot oil lines.
9. A piece of 2½-inch pipe having a joint construction between the sections of wrapping embodying the use of a special heavy covering and a special plastic compound which can be applied without heating; the finished joint is coated with hot asphalt.
10. A piece of single covered machine-wrapped 2-inch pipe which had previously been under test for sixteen months.

Electrical Measurement

As the avenues by which soil water could reach the pipe itself through the protecting films or layers were invisible to the eye, even aided by the microscope, it was determined to detect the presence of, and measure the magnitude of, these avenues electrically.

The results of these tests indicated that bare pipe placed underground may develop differences of potential between nearby areas on its surface, especially with variable aeration, ranging above 30 millivolts. A difference of potential of 50 millivolts, coupled with the presence of a suitable electrolyte, and with only a moderate earth resistance, may bring about perforation of pipe walls in from two to twelve years.

In the case of the painted specimens featured in these tests, the thickness of the coatings of paint was not sufficient to prevent the rapid development of water or moisture filled channels, reaching from the outside medium to the metal surface, in a sufficient number, or of sufficient aggregate magnitude, to form a conducting system for a certain quantity of electricity. This quantity was sufficient to bring about the removal of such an amount of the iron that the paint films literally had their foundations taken away from under them.

Results of Tests

The asphalt dipped coating required a longer time for the permeation of sufficient water to form conducting channels to the metal surface than the painted samples. The resistance of the single wrapped coating was greater than that of the dipped coating, and that of the double wrapping considerably higher than that of the single wrapping.

The accumulation of products of corrosion beneath any protective medium, whether paint, asphalt dip, or covering, is a subject for serious consideration. In the Terra Bella and Lindsay-Strathmore Irrigation Districts in Tulare County, California, 250 miles of single covered riveted steel pipe ranging from 4-inch to 36-inch has been in service from eight to nine years. The engineer of these projects, Stephen E. Kieffer of San Francisco states that "experience has shown the life of unprotected light steel pipes to be about five years" in the soils of those districts. On uncovering these lines for connections and changes after nine years, they show, in the words of Mr. Kieffer, "depreciation is practically nil and the life of the pipe is beyond prediction."

Report *of* Sub-Committee *on* Meter Diaphragms

OTTO GOLDCAMP, *Chairman*
San Diego Consolidated Gas & Electric Co.

A GREAT number of meter diaphragms of all makes, sizes and types in gas meters using leather in the measuring chambers, deteriorate prematurely under certain conditions of ordinary operation. This condition often occurs in periods as short as 120 days after their installation into service and investigations show that these meters were not overloaded; neither was there continuous demand above reasonable amounts of consumption, in many instances not exceeding 50,000 cubic feet of gas for the life of the diaphragm.

Otto Goldcamp

In the past, gas men familiar with premature deterioration of diaphragms have advanced many opinions as to the causes, such as faulty design of the meters, poor grades of leather, incorrect assemblage of diaphragm into the meter and numerous other conditions. However, careful examination by this committee showed that these assertions are hardly justified, there being very little evidence to show that the manufacturers of gas meters and diaphragms could be blamed for premature diaphragm deterioation.

Different Localities Represented

The committee, from the beginning of its work felt that some definite solution should be found, or if possible, that the real cause of this condition should be determined. In order that results might be of value in a general instead of a local way, diaphragms from different parts of the country were gathered to determine if premature deterioration was due to the same chemical action in different localities. This showed that a similar condition exists in all samples submitted.

During the investigation diaphragms and data were accumulated from low

pressure sections of distribution, containing about 20,000 meters operated under conditions where the gas carried a high moisture content. These results were compared with data from a like number of meters operating on the same gas in a section of the distribution system where the gas was comparatively free from moisture. Results showed that the dry condition of the gas eliminated premature diaphragm deterioration, while in the gas containing a high moisture content diaphragms were found to be in a rapid state of deterioration.

In order that these developments could be watched more closely equipment was installed in the plant so conditions could be duplicated as desired and millions of cubic feet of gas were passed through meters of the same design as used in the above mentioned sections of distribution.

Dry gas was created by impingement with certain chemicals which lowered the humidity to a minimum. Meters on this experimental installation were operated under a 100 per cent overload, but the diaphragms, upon examination, showed no signs of deterioration, not even changing the color of the leather.

Meters running in parallel positions, but operated on saturated gas showed complete deterioration of diaphragms and oxidation of the parts. The moisture in the gas created a chemical condition which caused this deteriorating action.

Diaphragm Forming

Microscopic examination was made of various types of diaphragms and it was discovered that large numbers of fibers were injured in the leather at the hinging points during tying or blocking of diaphragms, according to the type.

In meters operating on saturated gas this condition in the diaphragms is partially responsible for the premature deterioration, as the weakened condition of the diaphragm offers less resistance to the chemical action created by the moisture in the gas.

Diaphragms having these defects in them, operating in comparatively dry gas, showed no serious developments.

Research was conducted to determine the most suitable leather for the manufacture of diaphragms. Sample diaphragms were made and tested under most severe conditions with the expectations of carrying on further research upon the diaphragms meeting the most essential requirements.

Chrome and semi-chrome leather of different degrees of basicity show great promise in these tests. Samples of chrome leather heretofore tested, have all been of foreign manufacture, but recently samples of domestic semi-chrome leather have been received and similar tests to those mentioned above will be conducted in the future.

Refractories Problems *in the* Oil Gas Industry

A Paper by H. J. KNOLLMAN
Los Angeles Gas & Electric Corporation

REFRACTORIES in the combustion zone of generators must be able to withstand the cutting action of flame and resist high temperatures; they must have spall-resisting properties, expand and contract within reasonable limits, and be able to resist pressures to which they may be subjected without deformation. Generally, unequal distribution of heat, due to relative location of fire brick and burners, forcing the generator, increased flame length, and fallen checkerbrick overhead, are the principal causes of refractories failure. Where they are subjected to the direct action of the flame, the highest grade of refractories is required; otherwise, the temperatures in a generator are not excessive, and fire brick of average refractoriness will serve. Proper burner location, sufficiently high rise of arch, a number of arch brick circles, are also safeguards against failures. Other important factors of long refractory life are skilled workmanship in laying up the refractories, brick perfectly true to shape, thin refractory mortar joints, and slow heating up and cooling down of generators before and after a shutdown in operations.

H. J. Knollman

Checkerbrick in various sections of a generator have to withstand different sets of conditions. The upper checkers are subject to deterioration from rapid temperature fluctuations, and penetration of oil, steam, and gases, so that they tend to become porous, fragile, and weak. Dense brick are superior in offering resistance to their penetration, especially gases, so that as dense a brick as is consistent with freedom from cracking and spalling is most desirable. Lower checker brick have to withstand more or less severe temperatures and carry heavy loads, so that they are subject to glazing, partial melting, or excessive cracking or warping. Dense well-burned brick having high transverse strength of sufficient refractoriness to withstand the high temperatures are here required. Bricks of high mechanical strength are especially required for checker use just above the arches.

The rapid absorption and storage of heat is of great importance in checker bricks. Heat transfer takes place chiefly by conduction. Bricks having high thermal conductivity transfer heat from the gases to the brick and the reverse most efficiently. The chief factors increasing conductivity are increase in temperature and increase in density of the brick; consequently, the denser the checker brick the more valuable is it as a conductor of heat, so that their use means a marked gain in heat transfer ability. Fine grained, machine made, hard burned fire-clay brick are therefore superior to the softer more porous brick for checker use.

The extent to which heat will be diffused through the checker brick with rapid or fluctuating temperature conditions such as found in the generator is dependent upon their diffusivity. This constant must be known in order to find how much heat will be stored in a brick in a given time. High diffusivity is very desirable in checkers.

Heat Capacity

High heat capacity is also highly desirable, as it determines the total amount of heat that can be absorbed by the check brick. It is dependent upon the brick density, specific heat, dimensions, and the temperature difference of the surface of the brick and its initial temperature. The time required to reach near saturation varies considerably with different refractories and varies as the square of the thickness for the same brick. The total heat absorbed per unit volume and per total volume of a generator is dependent upon the heat capacity of the brick used, the thickness of checker wall, spacing between bricks, and the nature of the checker brick construction.

The physical properties along with their probable limitations, and the heat transfer properties of fire clay, silica and magnesite bricks, as well as the superrefractries, are discussed in the report.

The relative size of, and air spacings between, checker brick should be such as to offer maximum heat absorption, minimum retardation of gas flow, combined with structural strength and durability. In general, the actually effective brickwork in the checkers rapidly decreases with increased size of checkers and with increased thickness of brickwork. The checkers should thus be as thin as is consistent with strength and the checker openings as small as is consistent with proper gas flow and freedom from danger of excessive carbonization.

Heat Transfer

The heat transfer coefficient is a constant, varying in value, which determines the rate of heat transfer from the gases to the brick surface. It is dependent upon the temperature of the gases, their density and velocity, size and shape of checker flues. The larger the coefficient the greater is the transfer of the heat of the gases to the brick and vice versa.

Different types of insulation and of insulating materials along with their limitations and insulating properties are discussed in the report.

Employees' Relations *with the* Public—*A* Report

WILLIAM H. BARTON, *Chairman, Portland Gas & Coke Company*

THE report, designed to link up with a report submitted last year by the same committee, in introduction emphasizes the fact that the management of a utility must be ever alive to opportunities for improvement of service, not leaving this responsibility with the employees, although their cooperation is essential after they have been made familiar with the type of service expected of them.

William H. Barton

Factors involved in serving customers should be analyzed, and to this end it is helpful to standardize on best methods of giving out information, to secure reports from employees on criticisms made by customers, to analyze the incoming correspondence and to follow up orders for discontinuance of service where premises are not vacated.

Employee Selection

Foremen or division heads should not be permitted to select those employees who meet the public. The importance of this contact work should be stressed and the selection of the workers be left to a supervisor of higher rank. Those whose natural traits adapt them to this type of work should be selected. The ideals of the utility should be "sold" to the employee.

Systematic Training Needed

Training of employees should be an integral part of company policy, and should be calculated to give the employee a working knowledge of the entire field of the utility's business, to inculcate a spirit of loyalty to the company.

Employees should be made to realize that their conduct outside of business hours influences the public estimate of the company.

Conduct on Premises, Streets

Control of outside men, though difficult, should be stressed, and instruction manuals will be found useful. Uniforming outside employees is good practice in cities of 50,000 or more. Employees should not enter homes unless admitted by occupants. Keeping men in definite territories permits them to gain customers' confidence. Outside men may aid in appliance sales.

Men representing the company on the public streets should learn to respect public rights, safety regulations, and the requirements of courtesy.

Handling Customers' Calls

Some companies are concentrating in separate departments the handling of all calls from customers, feeling that thus the customer is assured better representation. Other companies feel that the public relation function should permeate all departments, which also represents this committee's opinion. Customers should be surrounded by a personal atmosphere. Telephone systems should be adequate to handle customers' calls with facility.

Employee Incentives

Wage is not a sufficient incentive to insure a response to the service ideal, though wage scales must reflect the caliber of work performed, and promotion must be understood to come as a reward for merit shown. Vacations, sick leaves, leaves of absence, are problems, especially in case of "daily pay" employees, and pensioning retired employees is another practice requiring considerable study. Group insurance is widely used by utilities on the principle that added efficiency results from the expense. Profit sharing should be a reward for added efficiency. All of these incentives affect the employees' attitude toward the public. Gas associations are urged to keep standing committees active in this field.

Instruction Manuals

Manuals outlining the principles involved in public relations work and good will development might well be prepared by the Association, such manuals to be supplemented by the individual companies with material of local nature. Standardization of procedure would result.

Employees' Use of Appliances

Use of company service and appliances should be encouraged among employees by discounts and sales inducements.

Publicity

The public should be given a conception, through advertising, of the scope and nature of the utility's work. The utility's story should be told before the company is on the defensive. The management should be active in acquainting both public and employees with company policies and problems.

The field of employees' relations with the public should be viewed open mindedly, for it is capable of extensive development.

Addition *of* Inert Gases *to* Increase Plant Capacity

F. A. HOUGH *and* J. R. MCLAUGHLIN
Southern Counties Gas Company

THE gas companies in Los Angeles and Santa Barbara distribute a mixed gas which consists of natural gas and oil gas. During periods when there is a surplus of natural gas, the oil gas is replaced by a "reformed gas" made by cracking of natural gas.

F. A. Hough

The object of this investigation conducted at the Santa Barbara plant of the Southern Counties Gas Company was to determine what conditions of plant operation would give the maximum plant capacity and over all efficiency during the manufacture of the reformed gas, special attention being given to the effect of adding air or inerts to the generator during the gas-making period.

From tests reported by Mr. Masser of the Los Angeles Gas & Electric Corporation, it is found that the thermal efficiency of reforming increases from 61 per cent to 83.4 per cent when the heating value of the reformed gas is increased from 550 to 750 B.t.u. It is evident that much of the advantage that might be gained by manufacturing a high B.t.u. reformed gas is lost because a comparatively small fraction of the total natural gas can be used untreated. By introducing inerts in the reforming process, it would seem that the heating value of the reformed gas could be reduced without losing the high thermal efficiency and generator capacity obtained with high-heating-value gas.

Conclusions

From a series of calculations and plant tests which have been made showing the effect produced on the volume of natural gas used in the reforming process, the heating value of reformed gas, the thermal efficiency of mixed gas production, the generator efficiency, the density of reformed gas, and the nitrogen content of reformed gas, when inerts are introduced into the generator during the reforming process, it is possible to draw the following conclusions:

1. A marked increase in plant capacity is obtained by the use of inerts.

2. The thermal efficiency of the reforming generator remains constant or decreases as the percentage of inerts is increased.

3. The thermal efficiency of production of a mixed gas of 700 B.t.u. heating value is increased by the use of inerts.

4. The use of inerts effects a saving in the steam required to operate generator and auxiliaries.

5. The life of a generator is probably increased by the use of inerts.

6. The use of inerts makes it more difficult to completely remove tar and lampblack from reformed gas.

7. The use of inerts increases the density of the gas produced.

8. When a 700 B.t.u. mixed gas is supplied in Santa Barbara, it is not possible to increase the ratio of air to make gas beyond 0.4 without causing trouble in the utilization of the gas.

9. In Santa Barbara the greatest benefit, so far as efficiency of production and plant capacity are concerned, is to be derived from the use of inerts when the percentage of inerts used is as great as possible without interfering with utilization, and when the heating value of the reformed gas is held as low as possible. A heating value of 460 B.t.u. and a ratio of air to make gas of slightly less the 0.4 should give best results.

Unaccounted-for Gas *is* Subject *of* Report

W. M. Henderson, *Chairman*
Los Angeles Gas & Electric Corporation

THE report of the committee for 1925 is a compilation of field observations and tests of some of the factors responsible for unaccounted-for gas. Each member of the committee contributed a record of the leakage survey and elimination work that has been carried on under his supervision during the past year or more.

W. M. Henderson

The committee reports this as a valuable contribution to the industry, for it sets forth the results that have been accomplished by a thorough trial and study of certain of the leakage factors.

In addition to the individual reports on leakage survey, special assignments were made on some particular subjects that have a close bearing on gas leakage, such as gas lost by D. R. meters, defective fittings, leaks at meter swivels, effect of pressure on leakage.

Contents

A brief outline of the contents of the report in the order of presentation follows:

The method followed by the Southern California Gas Company in leakage survey and elimination is presented in detail. A complete outline of the procedure, a description of the district surveyed, forms used and records kept are offered and show the detail on numerous actual surveys before and after repairs have been made. First, the record of mains and services and all gas equipment in the territory is shown in table form and a record of the leakage observed under test. Second, a record of leakage after all equipment above ground has been repaired. Third, a record of leakage after services have been repaired. Fourth, a final report on the system after the mains have been overhauled or replaced.

Costs Reported

This gives a record divided into three classes, overhead, services and mains. As many cases are cited, a fair conclusion can be drawn on the location of leakage. Costs on leakage work are a part of the report, as well as an estimate on the survey. As a part of this record, there are a number of curves to illustrate the results obtained in three divisions of the Southern California Gas Company territory since the introduction in 1923 of leakage survey and correction.

A report from the Los Angeles Gas & Electric Corporation on leakage tests on gas mains. This contains a list of equipment used on survey, the procedure followed, and the results obtained. Forms used for recording results and a recapitulation on eight different street main surveys are set up.

Testing Procedure

The procedure followed in testing provides for the isolation of a section of main. A Westinghouse meter is installed and if the service is high pressure, a governor is used to maintain constant pressure. All services are shut off at the riser and gas is admitted to the main through the meter. Record is made of the gas passed. This is reduced to standard conditions and then calculated on the basis of leakage per mile of main per month. Leakage in excess of 50,000 cubic feet per mile per month is considered serious enough to locate and repair.

The Short & Mason leak detector is used to locate leaks. A final test is run on the piece of main after repairs. Costs on leakage survey are kept separate from the cost of repairs. The record on such costs indicates that the locating of leaks cost about four times the repairs.

Premises Survey Record

The Los Angeles Gas & Electric Corporation has also contributed a record on premises survey. This inspection service was organized for the purpose of locating and repairing leaks at meter and regulator settings.

The report on this activity covers a total of 9,000 premises. The leaks observed are tabulated by listing the parts found leaking. A total of 5,170 leaks are reported. The tabulation is of considerable interest and value, as it indicates the weak factors in meter and regulator settings.

Example of Loss Reduction

The San Joaquin Light & Power Company presents a report on operation

(*Continued on Page* 54)

A Report *of the* Bureau *on* Co-operation

Morris F. Wales, *Chairman*
Coast Counties Gas & Electric Company

CO-OPERATION is defined as "the act of working jointly together." In its original form co-operation meant the welding together of employer and worker, but now applies to any quasi-union purposing to effect a mutually desired condition in otherwise individualistic enterprises. Co-operation is growing; the biggest asset of a co-operative organization is the support by the membership of the common policy. An association should not take over any managerial function belonging to individuals.

Function of P. C. G. A.

The obvious function of the Pacific Coast Gas Association is to provide contact between the gas company, the appliance manufacturer, and the appliance marketer.

The gas industry on the Pacific Coast has not taken full advantage of the possibilities of co-operation. No one of the several co-operative enterprises of the industry on the Coast can be said to be a meeting place for all of the minds of the industry. The Association is best adapted to serve this purpose, being organized and capable.

Recommendations Made

The committee offers the following recommendations:

(1) An effort should be made to bring into the Association all of the reputable manufacturers of gas appliances doing business on the Coast, and a sufficient number of representative dealers to assure consideration of their problems.

(2) The Association's enterprises should be strictly co-operative, not of managerial nature, but reflecting the common interests of the three classes of membership, giving each group a knowledge of the problems of the other two.

(3) Through the secretary's office the Association should undertake a definite program of technical and business research, securing, among other data, the physical statistics of the Pacific Coast Gas industry. These facts will aid in guiding publicity and in diffusing information.

Review Papers Presented *by* Gas Research Council

FOUR of the papers presented in abstract form in this issue of *Western Gas* represent the activities of the California Gas Research Council. It seems appropriate that with the publishing of these reviews due credit should be given the Council, and its engineer in charge, Walter M. Berry, for its effective endeavors, to which these papers bear partial witness.

Walter M. Berry

The papers referred to are: "An Improved Oil Spray and Burner for Generators," "Addition of Inert Gases to Increase Plant Capacity," "Refractories Problems in the Oil Gas Industry," and "Studies in Pipe Corrosion and Protection." These papers are duly credited to their authors in connection with the abstracts printed in this issue.

Nature of Council

A word regarding the formation and work of the California Gas Research Council may not be amiss at this point. The Council came into being about two years ago, as an outgrowth of the Joint Committee on Efficiency and Economy of Gas of the Railroad Commission of the State of California, and is a joint enterprise supported by the gas utilities of California and sponsored by the Railroad Commission. Eleven of the larger gas companies are joined in the Council program. Claude C. Brown, gas engineer of the Railroad Commission, is chairman of the Council, and Walter M. Berry, formerly with the United States Bureau of Standards, is actively in charge of the research work as engineer.

The projects on which report is now being made represented four out of the ten projects being carried on under the direction of the Council.

The last regular meeting of the Council was held on July 10 at the Los Angeles Gas and Electric Corporation's general office building. At a meeting of the executive committee of the Council, which followed the general session, plans were forwarded for further research activity which every member of the gas industry in the west will follow with keen interest.

Investigate Western Coals

A major undertaking which will concern the Council in the ensuing months is an investigation of Pacific Coast coals. This investigation is of sufficient importance from a national viewpoint to warrant the co-operation of the United States Bureau of Mines. William W. Odell, gas engineer of the Bureau, has already established headquarters on the Coast to begin work with the research department of the Pacific Gas and Electric Company.

From time to time *Western Gas* will carry features dealing with the work of the Gas Research Council, particularly as regards its investigation of the Pacific Coast coal situation.

Credits *and* Collections Sub-Committee Reports

F. L. NAGEL, *Chairman*
Portland Gas & Coke Company

THE credit and collection department is highly important in utility operation and is a builder of good will. Companies too small to maintain regular credit departments should train employees in diplomatic handling of the credit work, to serve customers smoothly and secure information of value to new business and sales departments.

The worker in the credit department must act as father confessor to customers, and must cultivate pleasantness and patience. Credit department employees should be carefully instructed in their duties by department heads.

Collection Operations

Use of outside agencies in collections is discouraged, except in very unusual cases. An interchange of company information is recommended in locating missing debtors.

Arguments are presented for the collection of current bills. It is pointed out that 33 to 45 per cent of such bills will be paid to collectors, making the money immediately available; that delinquent accounts are decreased due to collectors getting immediate notice of changing occupancy of premises; that personal representation with the customers builds good will. It is held that elimination of the cash discount would not increase the number of delinquent accounts, since customers would pay to secure uninterrupted service.

Where current bills are not personally collected the practice followed in collection is outlined, bills being rendered monthly and being delivered by an employee who also reads meters. A cash discount is usually allowed for payment within a limited time.

Bills for collection are segregated into three classes, those of $5 or less, those of $5 to $15, and those of $15 or over, and methods for collecting these three classes, and also for collecting delinquent final bills, are outlined in detail.

Fully 50 per cent of the bills written off may be charged to unable-to-locate accounts, in the committee's judgment. To reduce this loss the committee urges the securing of full information in the original entering of an account, including full name, previous addresses, name of employer, and two references.

Correspondence

Business letters, an important contact with customers, are written to get business, to carry on business, and to get money. The latter function is entirely that of the credit department, which also shares largely in the carrying-on-business type of correspondence. The department head should closely supervise correspondence. Prompt attention to letters is essential. Outgoing letters should be signed by the one dictating them rather than by the department head, to strengthen the personal touch.

Form letters are inelastic, but may be effective in calling attention of debtors to overdue accounts. The same may be said of printed forms.

Credit Approval

Only a few years have passed since the obnoxious practice of asking cash deposits before permitting the opening of a new account was in general use. It was a prime engenderer of ill will. Credit may be established by (1) reference to record with another public utility. Inquiry blanks may be used for this purpose. The committee strongly recommends the interchange of company information, pointing to last year's resolution of the Board of Directors of the Association, to the effect that credit information should be exchanged on a standard form, and deploring the slight use made of this device. In the committee's opinion it is possible to build up a clearing house of customer information at the Association's headquarters. (2) Commercial references; merchants are usually willing to co-operate in this regard, and good public relations may be created through this medium. (3) Character and reputation: the credit worker must possess good judgment; it is offered as supporting the practice of establishing credit on strength of character, that 98 per cent of the people are honest and mean to pay accounts, and that of this 98 per cent, 83 per cent do pay. (4) Cash deposit; this means should only be employed as a last resort. (5) Sureties or guarantors; this means is not only desirable, as it prevents difficulty in collection and is a rife breeder of ill will. If used, assurance should be had that the liability is clearly understood by the guarantor.

Credit Approval on Merchandise Sales

Credit approval on merchandise and by-products sales requires the close co-operation of sales and credit departments. The conditional or installment sales plan is discussed, together with legal phases of conditional sales contracts. Use of installment plan is

(*Continued on Page 64*)

EDITORIAL

The Portland Convention

THE 32d Annual Convention of the Pacific Coast Gas Association, to be held at Portland, Oregon, August 17-21, will be a meeting of outstanding importance, not only to the members of the Association and those interested in its varied problems, but in a very large measure to the entire gas industry of this great and growing territory which we speak of as The West. The program has been prepared with exceptional care to the end that all subjects possible to be covered in so short a session will be handled by men qualified to give the matters treated expert consideration of the highest order.

That all interested in gas who can spare the time will be there goes without saying, and that those who avail themselves of this opportunity will be more than repaid for the time spent is assured. Further, Portland is a beautiful and a hospitable city and will take care of its visitors in the true Western spirit. It will be a trip well worth while from all viewpoints—educational, technical, financial, healthful, recreational—and one that will be vastly beneficial to all branches of the gas industry. Don't miss this chance to broaden your vision and add to your sum total of health and efficiency—and, incidentally, to contribute your part toward the standardization and general betterment of everything pertaining to gas in its relations and service to the public.

The Growth of Utilities

THE growth, and along with it the growing importance of public utilities, is one of the marvels of this progressive age. Men of high executive ability and successful experience have met and solved problems of public service that would be impossible under old methods of government control, and yet with sufficient governmental supervision to insure the protection of every ratepayer and prevent the usurpation of any citizen's rights. A highly efficient and progressive public utility means a progressive community; a pace is set that arouses community interest and makes for progress in all lines. The service is improved while the cost is decreased. The investment is shared in by the people who profit by the dividends paid and the enterprise becomes largely co-operative. Foreign investors share the burdens that small localities could not well assume. The enterprise pays taxes, instead of the people being taxed to support it, and the improved and cheapened service, constantly kept "up to the minute" means a satisfied public, the doing away with local political squabbles, and on the whole a more prosperous and progressive community.

A Welcome Contribution

IN this issue *Western Gas* presents an article on gas utility rate-making, of which Claude C. Brown is author. Mr. Brown, as gas engineer for the Railroad Commission of the State of California, and as chairman of the California Gas Research Council, is intimately familiar with gas utility problems in the west, and we hope that his article will be but the forerunner of many others.

We are particularly appreciative of the opportunity to publish Mr. Brown's contribution, inasmuch as it is an expression from one associated with a public utility regulatory commission. *Western Gas* is the logical medium for the discussion of problems common both to utilities and to the public utility commissions which play so important a part in utility activity. We shall welcome additions to our editorial columns from other western commissions.

The Association Idea

TO believe in associations of men is merely to admit the development of a great truth. More than in any other period of the world's progress the past decade has seen the growth of numerous associations; and this is as it should be for nothing can be more injurious to man and his mental operations than isolation. He needs contact with his fellows, the measuring of swords, so to speak, the comparing of ideas.

While the gas industry is old and its members have been more or less associated together in years past for mutual benefit and protection, it is only very recently that the real benefits of association — co-operation and service — have been realized to any marked degree. The Pacific Coast Gas Association has found its place in the sun and is in a position to make real contributions to the industry. These contributions may manifest themselves tangibly, in the field of technical advance in our craft; and they may take a more intangible, but equally important form in the stimulation of thought and enthusiasm. No industrial association faces a broader opportunity for service to its industry than does the Pacific Coast Gas Association.

Some Phases *of* Gas Utility Rate Making

Service Costs Should be Distributed on Basis of Consumer Responsibility, Says Authority. Rate System Should Encourage the Efficient Utilization of Gas

By CLAUDE C. BROWN, *Gas Engineer*
Railroad Commission of the State of California

THE utilization of gas for domestic, commercial and industrial purposes has become so universally general and wide-spread that it is now recognized as the most efficient, cleanly and economical of fuels. As a matter of fact, there have come into existence many industries, the successful operation of whose manufacturing processes are absolutely dependent upon a constant and adequate supply of gas fuel. The use of gas as a heating and cooking fuel in the domestic home has practically supplanted the use of all other types of fuel, due largely to the fact that efforts are constantly being made by both the public utilities and also by the manufacturer of gas appliances, to improve the quality of the gas itself, the quality of the service under which it is distributed, and the type and operation of the gas appliances in which it is consumed.

When Rates Were Simple

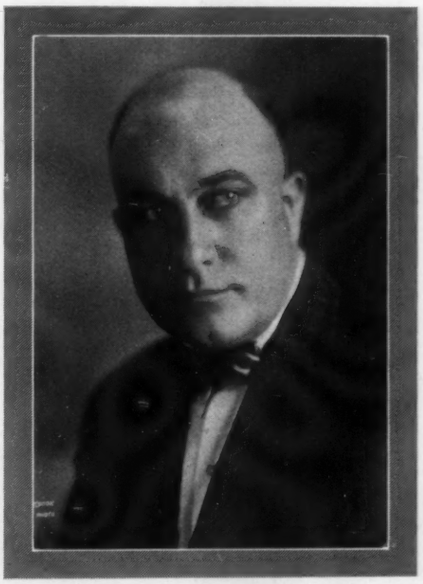
The cost of gas to the consumer has steadily decreased as improvement and economies have been effected in the methods of manufacture and distribution of this commodity. When gas first came into use it was utilized primarily for the purpose of lighting. The question of gas rates at that time was a comparatively simple problem, charges being made upon the basis of a flat rate per lamp, such lamps being assumed to operate for a certain number of hours each day. Obviously, as the number of consumers increased there became a great diversity in the size and type of lamps used, and also in the length of time the lamps were left burning.

It was then found necessary to find some means of actually measuring the amount of gas furnished to each consumer. The gas meter was then introduced and consumers were charged a flat rate per thousand cubic feet of gas consumed. Inasmuch as all of the consumers used the gas for lighting purposes and all of the early meters were operative, it was probably reasonable to charge upon the flat rate basis, under the assumption that each consumer should pay that proportion of the production and distribution costs as represented by the total amount of gas he consumed monthly.

Minimum Charge Introduced

Soon, however, the development of the electric lamp made electricity available for lighting purposes, and much of the gas lighting business was supplanted by electric lighting. The early electric lighting service was, however, somewhat unstable, and many of the consumers retained their gas equipment for standby and emergency service for use in case the electrical supply failed. The revenue from such installations, of course, dropped to little or nothing, and it was found necessary to place a minimum monthly charge on such meters.

In the early nineties the gas range and



—Photo by Hartsook
Claude C. Brown

gas water heater were developed and the use of this commodity for cooking and heating purposes started to gradually supplant the use of wood and coal. The use of gas for these purposes was later extended to hotels, restaurants, bakeries, etc., as well as to other commercial and industrial enterprises. At the present time, while lighting is done almost entirely by electricity, the use of gas has become almost universally general for heating, cooking and industrial heat processes.

The character of its uses produces widely different load factors and widely different periods of maximum demand. On the one hand we have the extreme yearly variation of peak and demand, due to the use of large quantities of gas for domestic purposes during the winter months. On the other hand, we have the industrial load which is not seasonal, and which requires a fairly constant supply of gas during the entire year. The industrial load is generally supplied in large quantities to juice consumers and through fewer meters than the domestic load, which is supplied in smaller quantities to a larger number of consumers. Thus the equity of the flat rate charge for gas no longer exists, and it becomes necessary to adjust the gas rates so that each consumer will bear as nearly as possible his share of the cost of furnishing gas and gas service to him.

An Ideal Rate

In a "Report in the Matter of Gas Rates in the City of New York Suburban Territory, Case No. 79," before the Public Service Commission of New York, Mr. A. E. Forstall, a consulting engineer, states:

> "An ideal rate schedule would be one that apportions to each class of customer the exact costs which the gas company had to meet in supplying him with the service and with the amount of gas that he used, and the nearer a schedule of rates can be made to approximate about that condition, the more nearly it is entirely and strictly equitable. Now, whether we can ever get such a schedule of rates I do not know, but we can come much closer to it than by charging a flat rate per thousand cubic feet of gas which recognizes no differences at all in the characteristics of the customers."

The present day methods of rate structure development and the fixing of gas rates by public service commissions recognize the fact that the gas business is inherently related to the public interest and that charges of gas service must be reasonable. On the other hand, where private property is utilized in public service, the fact is also recognized that a fair and adequate return should be allowed upon the capital invested, which is necessary for the efficient and economical rendering of such service. The problem of rate fixing, then, becomes one of allocating to each class of consumers, that schedule which will, over the yearly period, cause that class of consumers to furnish its proportion of the cost of service rendered to it, so that the sum

(*Continued on Page 64*)

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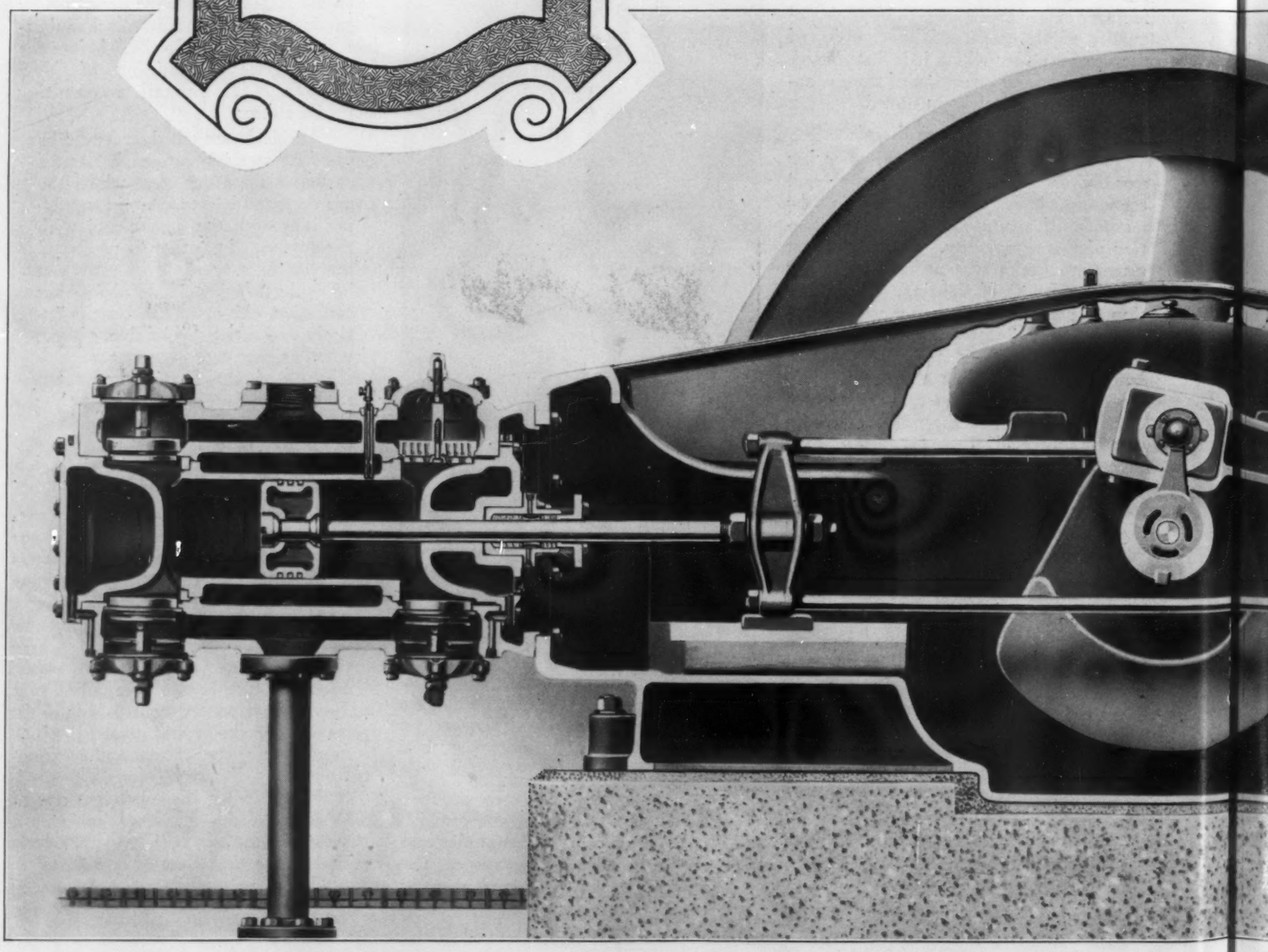

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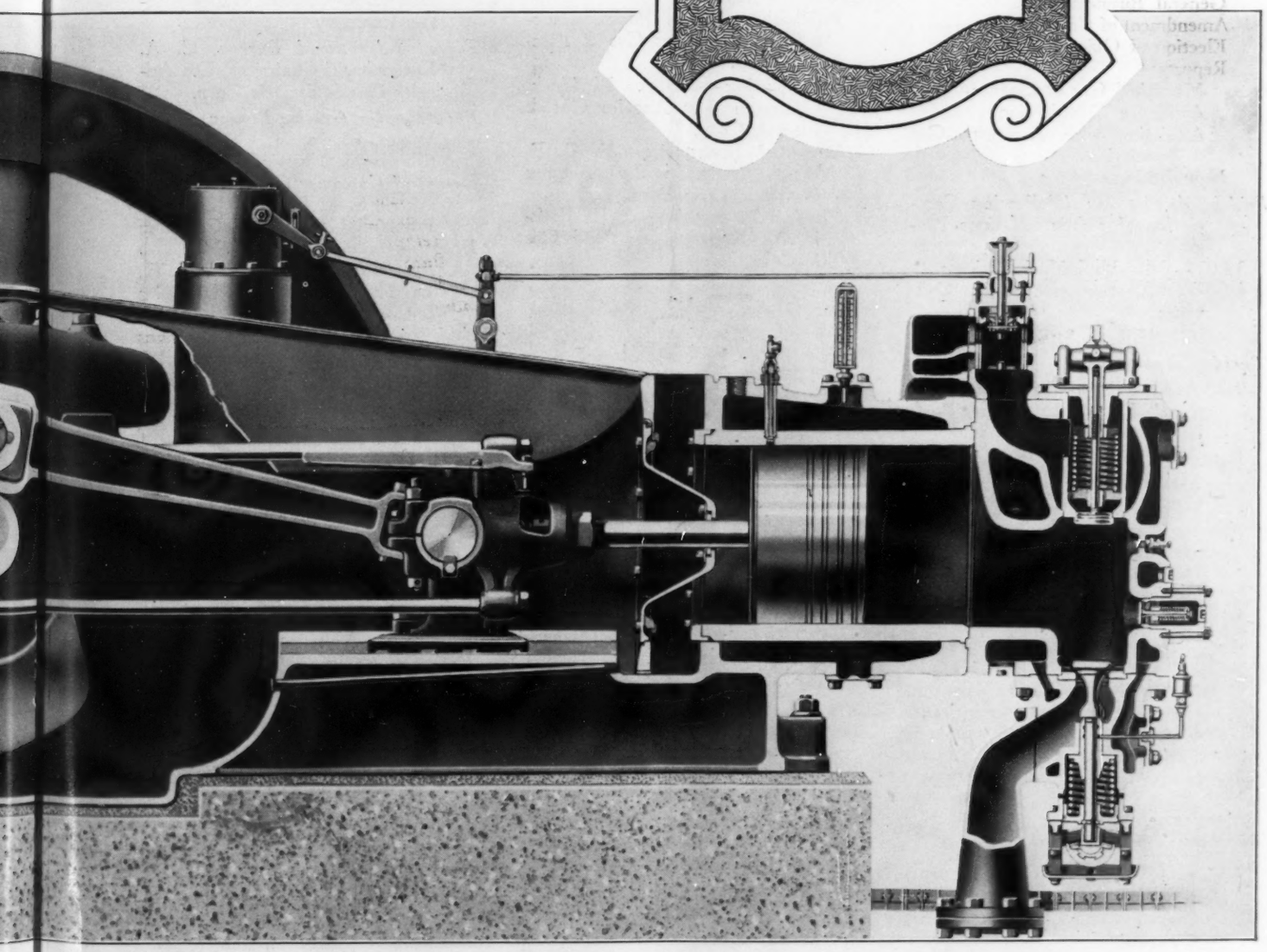


PACIFIC COAST GAS ASSOCIATION

The Complete Program *of the* Convention *at* Portland

There Will Be Speeches

SYNOPSIS OF BUSINESS PROGRAM

Monday, August 17:
2:00 P. M.—General Session
Address of Welcome—Geo. L. Baker, Mayor of Portland.
President's Address
General Business
Amendment of Constitution
Election of Officers
Reports:
Municipal Gas Ordinance
Appliance Certification
Affiliation with American Gas Association
New Business

Friday, August 21: (Following Completion of Public Relations Program)
3:00 P. M.—Unfinished Business
4:00 P. M.—Executive Session Convenes

GENERAL SESSION

Tuesday, August 18:
9:30 A. M.—*Paper*—"Premium Systems," Donald E. Buyers, Portland Gas & Coke Company

Paper—"The Future Fuel for Gas Making," W. S. Yard, Pacific Gas & Electric Company

Address—"Selling Co-operative Advertising to an Industry," Chas. Duncan, Foster & Kleiser of Calif.

Paper—"Intimate Public Relations," O. L. Moore, Los Angeles Gas & Electric Corp.

Paper—"Statistics—Their Value to the Operating Man and to the Executive," Rudolph Jenney, Pacific Gas & Electric Co.

Report—Merchandising Bureau, Commercial Section, A. L. Crane, Gas Appliance Society of Calif.

Illustrated Talk—"Accomplishments in Selling Gas to Industry," J. H. Gumz, Pacific Gas & Electric Company

ACCOUNTING SECTION

Thursday, August 20:
9:30 A. M.—*Address of Chairman*
C. W. Platt, Portland Gas & Coke Company

Report of Committee on Transportation Costs
D. G. Martin, Chairman, Pacific Gas & Electric Co.

Paper—"Cost of Keeping on Auxiliary Units," B. H. Parkinson, Portland Gas & Coke Company

Report of Purchasing and Stores Bureau
E. N. Simmons, Chairman, Los Angeles Gas & Electric Corp.

Committee Reports
Purchasing—T. B. Parks, Chairman, Los Angeles Gas & Electric Corp.
Warehousing—Wm. Maddock, Chairman, Los Angeles Gas & Electric Corp.
Perpetual Inventories—W. C. F. West, Chairman, Los Angeles Gas & Electric Corp.
Physical Inventories—B. H. Parkinson, Chairman, Portland Gas & Coke Company

There Will Be Banquets

Report of Customers' Bookkeeping Bureau, F. C. Ingram, Chairman, Southern California Gas Co.

Report of Committee on Credits and Collections, F. L. Nagel, Chairman, Portland Gas & Coke Co.

Report of Committee on Meter Reading, C. R. Johnson, Chairman, Portland Gas & Coke Co.

COMMERCIAL SECTION

Tuesday, August 18:
2:00 P. M.—*Address of Chairman*, Geo. E. Whitwell, Byllesby Engineering & Managemnt Corp.

Report of Advertising Bureau, F. U. Naylor, Chairman, Pacific Gas & Electric Co.

Report of Home Service Bureau, C. R. Miller, Chairman, Portland Gas & Coke Co.

Report of Industrial Utilization Bureau, J. H. Gumz, Chairman, Pacific Gas & Electric Co.

Committee Reports
Bakeries—H. S. Babb, Chairman, Portland Gas & Coke Company
Restaurants—W. R. Adams, Pacific Gas & Electric Company
Steam Boilers—C. A. Carlson, Pacific Gas & Electric Company

PUBLIC RELATIONS SECTION

Friday, August 21:
9:30 A. M.—*Address of Chairman*, Don C. Ray, Pacific Gas & Electric Company

Report Educational Bureau, C. A. Luckenbach, Chairman, Los Angeles Gas & Electric Corp.

Report of Cooperative Bureau, M. F. Wales, Chairman, Coast Counties Gas & Electric Co.

Report of Customer Ownership Committee, S. E. Skelley, Chairman, Portland Gas & Coke Company

Report of Committee on Employees Relations with the Public, W. H. Barton, Chairman, Portland Gas & Coke Company

Address—"Selling Public Relations to the Public," Norwood W. Brockett, Puget Sound Power & Light Co.

Report Management Committee, E. C. McCann, Chairman, Pacific Gas & Electric Company

Address—"Relations—Public or Human"

TECHNICAL SECTION

Tuesday, August 18:
2:00 P. M.—*Address of Chairman* W. S. Yard, Pacific Gas & Electric Company

Report of Purification Bureau, Frank Wills, Chairman, Pacific Gas & Electric Co.

There Will Be Golf

Committee Reports

Cottrell Process—F. J. Garland, Chairman, Public Service Company of Colo.

Oxide Purification—F. C. Jones, Chairman, Pacific Gas & Electric Company

Tar and Lampblack—S. C. Schwarz, Chairman, Portland Gas & Coke Company

Napthalene Removal—J. E. Spelce, Chairman, Pacific Gas & Electric Company

Paper—Notes on Liquid Purification, K. N. Cundall, Pacific Gas & Electric Company

Report of Natural Gas Bureau, A. F. Bridge, Chairman, Southern Counties Gas Co.

Committee Reports—

Transmission Line Capacity—F. F. Doyle, Chairman, Midway Gas Company

Measurement of High Pressure Gas—H. P. George, Chairman Midway Gas Company

Report of Safety Bureau—V. R. Hughes, Chairman, Pacific Gas & Electric Company

Report of Refractories Bureau—H. L. Masser, Chairman, Los Angeles Gas & Electric Corp.

Paper—"Refractory Problems in Oil Gas Manufacture," H. J. Knollman, Los Angeles Gas & Electric Corp.

Thursday, August 20:

9:30 A. M.—*Report of Manufacturing Processes Bureau*—Geo. Wehrle, Chairman, Public Service Company of Colo.

Committee Reports—

Oil Gas—J. M. Dickey, Chairman, Pacific Gas & Electric Co.

Water Gas—F. C. Hawks, Chairman, Tacoma Gas & Fuel Company

Coal Gas—John Keillor, Chairman, British Columbia Electric Ry. Co., Ltd.

Reformed Gas—Frederic Hough, Chairman, Southern Counties Gas Company

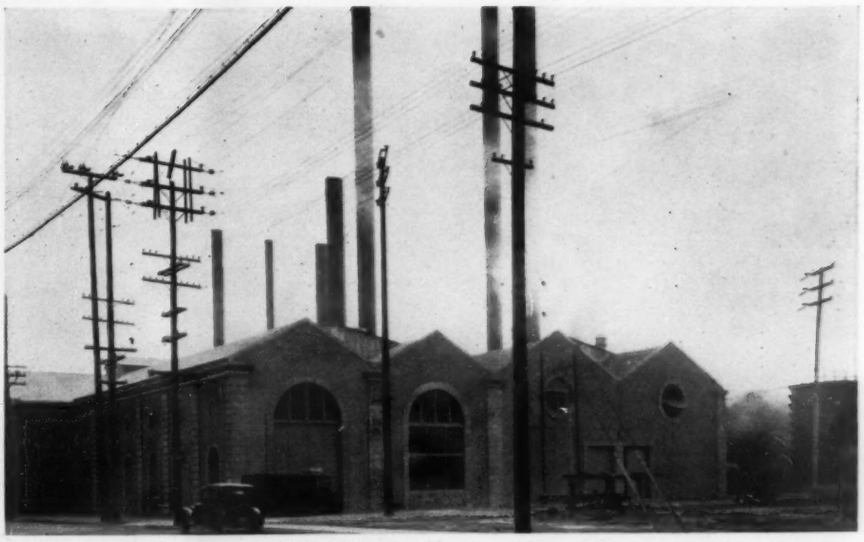
Paper—"An Improved Oil Spray for Oil Gas Generators"—J. E. Kelley, Western States Gas & Electric Company

TECHNICAL SECTION

Thursday, August 20 (Continued):

Paper—"Addition of Inert Gases to Increase Plant Capacity and Thermal Efficiency of the Reforming Process," Frederic Hough and J. R. McLaughlin, Southern Counties Gas Co.

(*Continued on Page 66*)



Municipal Light and Power Plant, Pasadena, Calif. Natural Gas Used Under Boilers.

Natural Gas Fuel *now* Generates Electricity *for* Pasadena

By George H. Finley

GAS has made another major step toward full recognition as the ideal fuel for industrial use. The City of Pasadena, on behalf of its Municipal Light and Power Department, has contracted with the Los Angeles Gas and Electric Corporation for the delivery of 1175 B. t. u. natural gas for generation of electrical energy.

The Municipal Light and Power Department supplies electricity for street lighting and domestic purposes within the city limits of Pasadena, and is using the gas under boilers at the city generating plant, replacing oil for that purpose.

To operate the steam turbines at this plant it is necessary to evaporate 180,000 lbs. of water an hour, according to B. F. DeLanty, acting general manager of the Municipal Light and Power Department. This involves a generation of 9,000 kilowatts to meet the present daily load and an estimated generation of 12,000 kilowatts to meet peak conditions, which in Pasadena occur in January or February.

Ready to Serve

Arrangements are completed, at present writing, for delivery of gas. A line drawing natural gas from the Rosecrans, Dominguez, Whittier and adjoining fields, and connecting also with the new Ventura supply, has been laid through Coyote Pass by the Los Angeles Gas and Electric Corporation, which is guaranteeing to supply 1175 B. t. u. gas for the Pasadena service. The line is approximately seven miles in length, eight-inch to twelve-inch pipe being used.

Peabody burners have been installed at the plant by the Municipal Light and Power Department, enabling the Department to switch over to oil in an emergency, as the service is on the customary surplus gas contract arrangement, giving preference to domestic consumer demands. Force draft blowers have been added to the equipment of two 1,000 H. P. boilers which are being switched over to gas, and the Department anticipates changing over the two additional boilers of 800 H. P. as soon as sufficient experience has been had with the new fuel.

Saving in Fuel Costs

The Pasadena plant will use an amount of gas estimated at 3,000,000 cubic feet a day, as an average figure. On this estimate the Department expects a material saving in fuel costs, at the present price of oil, for the gas will be delivered, according to Mr. DeLanty, at a rate equivalent to $1.18 oil.

Not only in actual money saving does the Department expect satisfaction from the introduction of gas heat. To quote Mr. DeLanty, "We feel that this is a step in advance because gas is so much easier to handle, and has been found to be a superior class of heat in many respects. For one thing, gas heat is easier on furnaces. Oil, in some cases, has burned the tubes off the walls of our fireboxes, necessitating the installation of baffle walls. Gas heat gives better distribution and is less severe. We feel further that added heat value will accom-

(*Continued on Page 62*)

Henry F. Ketz receiving a gold watch in recognition of his services in shutting off gas during temblor. Left to right: C. E. Rutledge, Henry F. Ketz, F. S. Wade, F. R. Bain, and F. H. Bivins

Meeting *an* Unusual Emergency *in* Santa Barbara Gas Service

Stricken City is Scene of Remarkable Activity as Gas Company Speeds Resumption of Service

By CLYDE H. POTTER
Southern Counties Gas Company

SELDOM is a gas utility called upon to meet an emergency such as that which the Southern Counties Gas Company of California recently faced at Santa Barbara, where an earthquake of considerable severity partially wrecked the city. In addition to causing widespread damage in the business section, the shocks broke gas mains in more than fifty places in various parts of the city and also snapped off more than 250 services.

Alertness Saves Loss

One of the outstanding acts of the disaster was that performed by the gas company's engineer, Henry F. Ketz, who showed remarkable cool-headedness during the emergency. While the earthquake was rocking the large plant and with machinery and equipment moving dangerously about him, he made his way across the engine room and before the first shock had passed, closed the large valve which supplied the city with gas. This presence of mind on the part of Ketz undoubtedly saved the city of Santa Barbara millions of dollars in fire loss and prevented explosions as well as loss of life.

Gas service was immediately discontinued to the 8,000 consumers in that city and it was at this time that the Southern Counties Gas Company and its organization made real public utility history. The regular crew at Santa Barbara was immediately pressed into service. In addition to these men, a large force from the utility's organization in various parts of Southern California was rushed to the scene. Within less than 24 hours after the earthquake, more than 100 men were at work on the huge task of restoring gas service to Santa Barbara and Montecito.

As a measure of safety gas company engineers decided that the first move on the part of the company should be to shut off each of the 8,000 services in the city of Santa Barbara. With this object in view the crew of over 100 expert gas men early Tuesday morning began the work of shutting off all services. Within the next 48 hours every house in Santa Barbara and Montecito was visited and the gas services turned off.

It is obvious to all gas engineers why this move was necessary. During the next several days a series of tests were put on the company's system to determine the location of leaks. Engineers feared that some consumers, in trying to get gas for cooking purposes, might turn on and forget to turn off gas at the appliance. Then, with the appliances open, explosions might have resulted, had not the gas been turned off at the services.

Leaks Located

When all services had been discontinued, the problem of locating and repairing leaks to the company's distribution system was started. A special gas of low combustible quality was manufactured at the gas plant. This low combustible gas gave off a strong odor. Men were stationed along the company's distribution system throughout the city and as the odorous gas was turned into the mains, it was easily detectible. The service men immediately reported the leaks and the gas was shut off. These leaks were at once repaired by emergency crews and the process of turning gas into the mains again proceeded. This testing of leaks continued for several days. It is interesting to note that when the gas was first turned into the system, a leakage of 57,000 cubic feet per hour was recorded. When the final test was put on the line, the leakage had been reduced to 10,000 cubic feet per hour, which company engineers deemed safe for the resumption of gas service.

At first the tests were put on the system for periods of 10 or 15 minutes, but as the emergency crews repaired the leaks, the tests became longer. The last test was maintained on the line for three hours. In one of the first tests it was noted that a consumer called the gas office on the telephone within five minutes to report that odorous gas was detectible on his premises. This point proved the effectiveness of the plan adopted by company engineers in locating leaks.

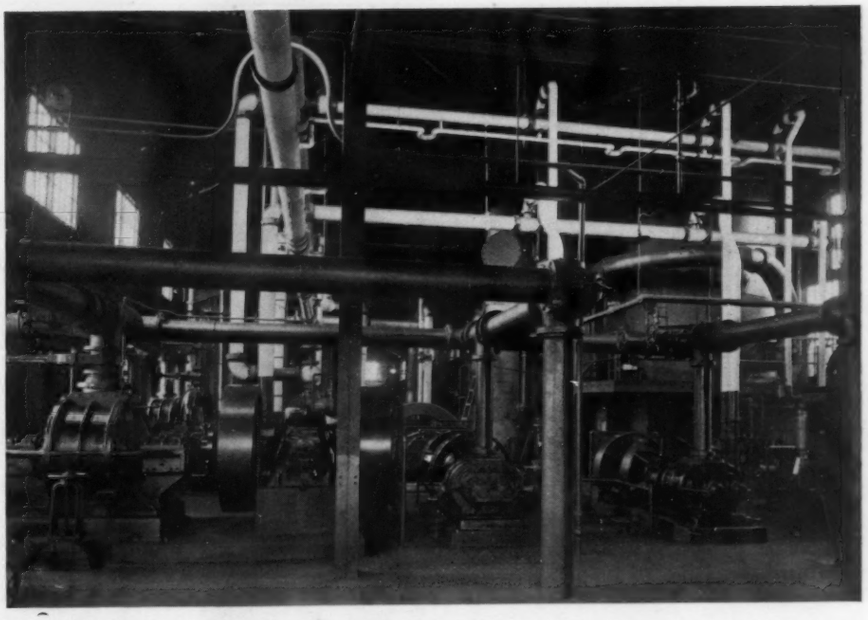
Emergency Line Laid

One very notable achievement performed by the gas company was that of laying an emergency gas main a distance of 2,500 feet to the two Santa Barbara

daily newspapers. This feat enabled both the Santa Barbara Daily News and the Santa Barbara Morning Press to publish papers uninterruptedly and broadcast to the citizens the news of the world.

Recognizing the public need for advice during this trying period, District Manager C. E. Rutledge, of the company's Santa Barbara properties, chose six of the best gas men on hand. He placed in charge of this work H. A. Dockstader, one of the oldest employees in point of service, in Santa Barbara.

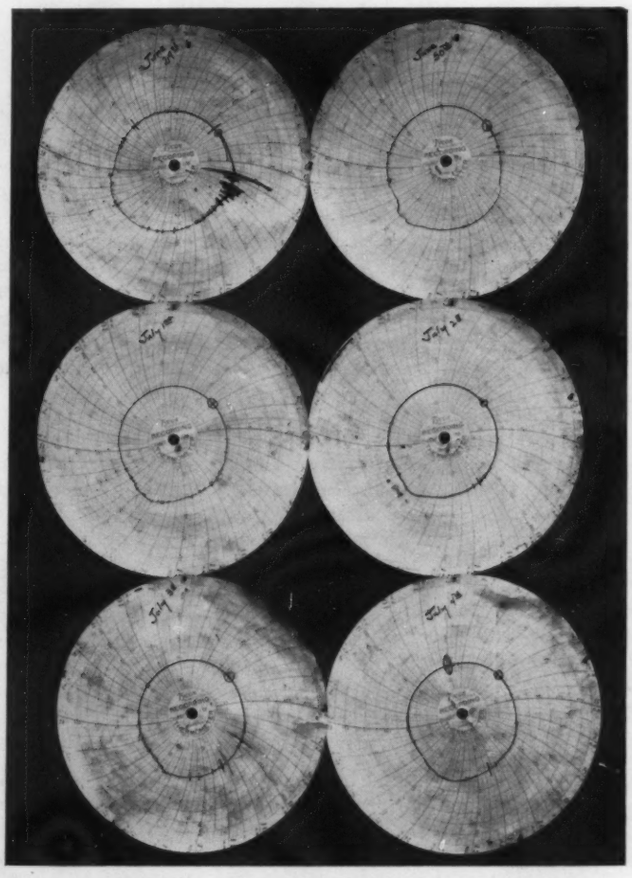
It was found that a line running from the gas plant on East Montecito Street to Santa Barbara and Haley Streets, was intact up to that point, and from there the Dockstader crew started. They installed a temporary line up Santa Barbara Sreet to Ortega; thence across to Anacapa to the rear of the old French restaurant property and then extended the line across this property to connect with the Santa Barbara Daily News office.



Interior of the Southern Counties Gas Company's plant at Santa Barbara

Record Time Made

Dockstader's crew put down the first length of pipe at 8 o'clock, Tuesday morning, the day after the earthquake. In four hours they were wiping the perspiration from their brows, and looking at the flame under metal pots at the Daily News office that told of their success. Because of the emergency which existed this temporary line was run on the surface of the streets, except at street crossings, where it was buried. Ordinarily, following out the usual work of digging trenches, it would have required at least a week to lay this particular line.



Recording thermometer at Santa Barbara gas plant. Note record of the severe shocks on June 29

The large emergency crew worked continuously from dawn to dusk in its endeavor to resume gas service at Santa Barbara and after a strenuous ten-day period, gas service was again available throughout the city. During the interval, while the 8,000 patrons were out of gas, the company told the story of its daily activities to the public through the press. Large display advertisements, as well as generous news stories appeared daily in the press. The consuming public was thus able to follow the company's campaign to resume service.

It is interesting to note that cast iron pipe was not injured in the least by the earthquake. Wrought iron screw pipes were snapped in many instances, all breaks occurring however at the coupling. This was true in gas mains in various parts of the city, measuring from one to six inches in size.

Plant Equipment Undamaged

A thorough investigation at the company's gas plant revealed the fact that the machinery and equipment was practically undamaged. With the exception of five roller-guides on the small 100,000 cubic foot gas holder and one roller-guide on the 300,000 cubic foot storage holder, no other damage was found at the plant. A peculiar freak of the earthquake is the fact that the two large generators shifted a half-inch on their base, but developed no breaks in any of the connections. This, according to company engineers, seems a remarkable fact, because in all parts of the city huge buildings were severely damaged.

The company's gas office at 16 east Canon Perdido Street was badly damaged. All of the plate glass windows in front of the building were broken and three walls were badly injured. A fire wall of the garage in back of the office came down with a crash, and a large partition wall between the office and the store-room was dangerously bulged. At the present time a crew of men are repairing the gas company's building, while the office force handles company business in a small section of the structure.

High Praise to Workers

Manager Rutledge maintains at Santa Barbara a regular crew of 35 men. These employees, because of their thorough knowledge of Santa Barbara, were able to render invaluable aid in the work of repairing the company's damaged mains. Mr. Rutledge has only the

(*Continued on Page 62*)

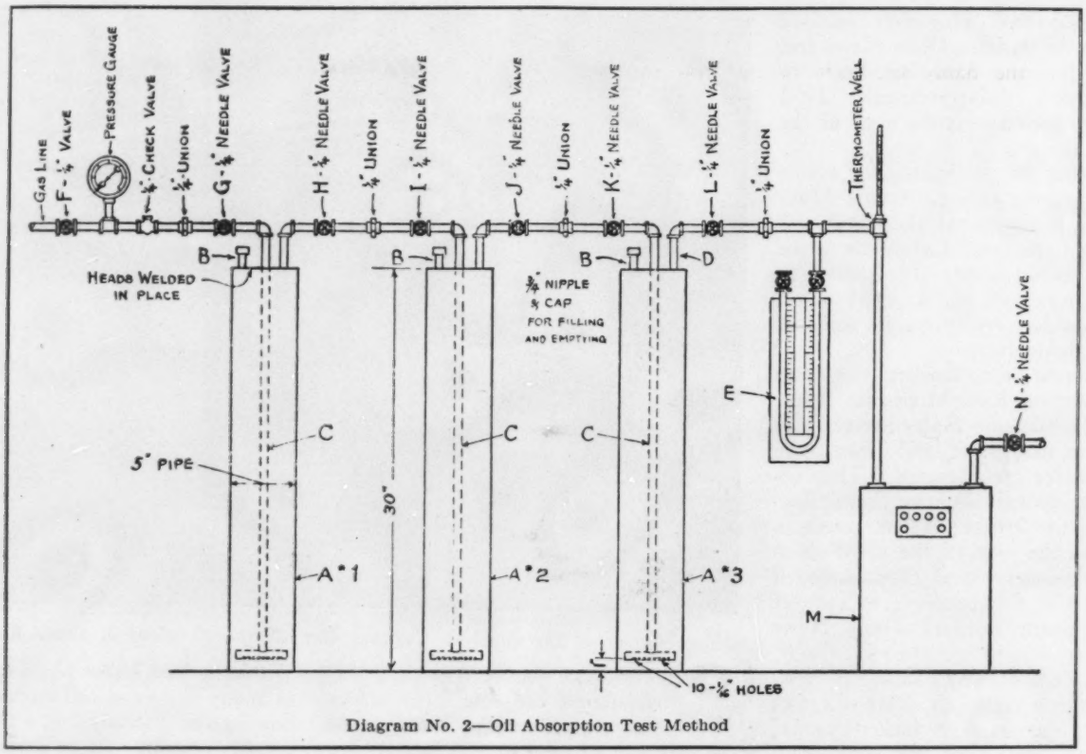


Diagram No. 2—Oil Absorption Test Method

Testing Natural Gas *for* Gasoline Content

The Second of a Series of Three Articles on Standard Testing Practice, Presenting the Oil Absorption Test Method, with Apparatus and Procedure Described in Full

IN the July number of *Western Gas* there was presented the first of a series of three articles on "Testing Natural Gas for Gasoline Content." These articles are being published for two purposes—first, to give the natural gas and gasoline men on the Pacific Coast, who are not members of the Natural Gas Association of America, the benefit of the latter Association's research on this subject of testing gas for gasoline content, and second, in order that the committee of the Natural Gas Association which prepared these reports may have the benefit of suggestions and criticism from men engaged in the natural gas and gasoline business on the Pacific Coast. It is therefore urged that those companies on the Pacific Coast which are interested either directly or indirectly in the natural gasoline business and have proper laboratory facilities to do so, give each of the three methods described in the Natural Gas Association's report, a thorough test.

The method described in the July number of *Western Gas* is known as the compression and cooling test method. The method given below is known as the oil absorption method.

Making of Tests Urged

While the oil absorption method of testing natural gas for gasoline content as described below is much less used in California than the charcoal method, it is hoped that those companies who are able to do so will, for comparative purposes at least, make a series of tests according to the instructions given, and report the result of such tests to the Natural Gas Association. It appears that the apparatus required for making tests by this method is somewhat cumbersome, and that the time required for making the test would be considerably longer than where the charcoal method of testing is used. Against this disadvantage, however, the following advantages may be named:

Advantages of Method

This method approximates the actual operation of an oil absorption plant in that oil is used as an absorption medium, and also it treats a relatively large volume of gas, thus reducing the liability of experimental error, and the amount of gasoline recovered is substantial.

Undoubtedly the best known test in California based on the oil absorption principle, is the test made by the "Newton" apparatus. This apparatus which gives a direct reading in pints per thousand from an empirically graduated scale, depends upon the increase in volume of a given amount of absorption oil when natural gas is passed through the oil from a calibrated orifice under a constant head of 8-inch water column. The method seems to be approximately correct, only where the gasoline content of gas is around eight-tenths of a gallon per thousand cubic foot. If the content is either substantially above or below this figure, the readings on the Newton scale are likely to show wide errors from the true gasoline content of the gas.

Method is Convenient

It may be said, however, that this method of testing is very convenient, the apparatus entirely portable, and gives a direct reading in a short length of time. On this basis, it is quite useful for making approximate tests in the field.

It might be suggested that in connection with tests made under the direction of the Natural Gas Association of America, some parallel tests should be run with the Newton apparatus, to determine more accurately than in the past its limitations with the various qualities of gas.

Comments Welcomed

The editors of *Western Gas* will be glad to receive any comments concerning the tests described in this series, or they

may be forwarded direct to Mr. William B. Way, General Secretary, Natural Gas Association of America, Pittsburgh, Pa.

F. S. WADE,
Vice-President and Manager,
Southern Counties Gas Company.

The following material is taken from the report of the committee on standard testing for gasoline, adopted as a tentative standard for trial by the Natural Gas Association of America.

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Oil Absorption Test Method

Foreword.—The Apparatus and Procedure herein described for the Oil Absorption Test Method were adopted by the Gasoline Committee after much study and experimentation. Necessarily, choice had to be made between various alternate forms of apparatus and steps in procedure. Should experience in general use throughout the industry develop facts which would make any changes or modifications in apparatus or procedure advisable, such changes will be made by the Committee before this Test Method is adopted as a Standard by the Natural Gas Association of America.

Criticisms and constructive suggestions covering the Apparatus and Procedure of this Oil Absorption Test Method will be appreciated and given careful consideration and study by the Gasoline Committee.

Correspondence should be addressed to Mr. Wm. B. Way, Secretary, The Natural Gas Association of America, Pittsburgh, Pa.

1. Materials

A. *Oil*

The oil to be used for the purpose of this test is known commercially as Mineral Seal Oil, or Absorbent Oil, and shall have the following specifications:

1. Color—White to pale yellow.
2. Odor—Sweet.
3. Cold Test—Less than 32° F.
4. Viscosity—35 to 140 seconds at 100° F. (Saybolt).
5. Emulsifying Bodies—Practically none.
6. Fire Distillation—Initial boiling point to be not less than 480° F. and not more than 3% over at 500° F.

B. Ice for Condenser

2. Absorption Apparatus

(Refer to Diagram No. 2)

A1, A2, A3—3 Absorbers, in series, 5″ Diameter, 30″ long.

B. ¾″ pipe nipple, 2″ long for introduction of oil. Cap on top for closing.

C. Gas inlet pipe extending to within 1″ of bottom of absorber, fitted with a tee and two short nipples, each nipple

(*Continued on Page 56*)

Shatto Place, Los Angeles. Every apartment in this block is heated with gas.

Selling *the* Apartment House *to the* Use *of* Gas Fuel

By C. M. ROBERT,
Industrial Engineer, Los Angeles Gas & Electric Corporation

IT can probably be stated without contradiction that the inhabitants of Los Angeles are more nearly one hundred per cent gas users than those of any other city in the world. This condition is due principally to three things: cheap rates, high quality of gas, and climate.

In the heating field, other than industrial, approximately 99% of heating devices are gas fired; and yet, with this most wonderful showing, there is one type of buildings where there is still much work to do. These are the apartment houses with a capacity ranging from 25 rooms upward. Apartment house heating installations in too many instances have not been installed because they were the best type of installations for the purpose, but either because they were cheaper or because of high powered salesmanship. Insufficient thought has been given to the size of the houses or the class of tenants which would occupy them; and yet, with the many mistakes in the character of equipment originally installed, there have been practically no instances where these houses changed to other fuels after once using gas, due principally to the alertness of the industrial departments of the gas companies in rectifying these mistakes to the satisfaction of the consumer.

Don't Sell on B. t. u. Basis

While we have a very high quality of gas in Los Angeles at low rates we also have very cheap fuel oil, and because of this many gas appliance salesmen have made the mistake of trying to sell gas to compete with oil on a B. t. u. basis. This should not be done, but rather the gas should be sold as a superior fuel for which the consumer should expect to and does pay more money in actual dollars and cents and for which he receives a correspondingly greater service and a correspondingly greater satisfaction both to himself and to his tenants. The saving and added satisfaction come in the elimination of dirt, soot, installation of fuel oil tanks and the filling of these tanks, the saving in labor with gas over oil, and in the fact that oil must be atomized with either steam, water or electricity.

Apartment houses ranging from 25 apartments downward are nearly 100 per cent gas heated. In the large buildings with from 25 to 100 apartments only about 25 per cent are gas heated, and yet every apartment house with less than 100 apartments should heat with gas. Of course this assertion will not hold good in other cities on the coast where conditions are not as favorable as here, but the gas companies, manufacturers, jobbers and retailers in every city should set a goal in fixing the maximum size of apartment houses to be solicited and should then co-operate to the utmost in converting these houses to gas heating.

(*Continued on Page 58*)

Appliance Dealers Unite *in* New Association

"Gas Appliance Association of Southern California" now Functioning, with Permanent Offices in Los Angeles. Planning Campaign among Dealers to Recruit Membership

By GEO. FINNEY, *Secretary*
Gas Appliance Association of Southern California

IN the early part of the year 1925 a few of the representative wholesale gas appliance dealers of the city of Los Angeles, realizing the many possibilities for improvement in the condition of the appliance business in Southern California, conducted several meetings with a view to establishing a permanent organization for the betterment of gas appliance merchandizing.

An Auspicious Beginning

Out of the meetings of these few representative dealers there has come into being the Gas Appliance Association of Southern California. Several organization meetings held in June and July culminated in the election of officers and directorate, and the establishment of permanent headquarters in charge of an executive secretary. An initial membership of the three public utility gas companies of Los Angeles, 15 manufacturers, 17 jobbers and manufacturers' agents and a number of retail gas appliance dealers would appear to launch the new organization under favorable auspices.

Following is a list of the officers and directors of the Association:

Officers and Directors

E. A. Norton, Barker Bros., president; A. F. Rice, Cribben and Sexton, vice-president; Geo. Finney, secretary; Francis Regan, Union Hardware and Metal Company, treasurer; T. J. Protheroe, Southern California Gas Company; J. E. Moore, A. B. Stove Company; J. H. Hubbard, Snow Manufacturing Company; D. P. O'Keefe, O'Keefe and Merritt Company; E. S. Hoyt, Jr., Hoyt Heater Company; E. A. Jones, Williams Radiator Company; Harry Payne, Payne Furnace and Supply Company; N. T. Dennis, Holbrook, Merrill and Stetson Company; Fred Forrest, Forrest Stove Works; P. B. Taylor, C. B. Babcock Company; J. Graham Hambly, Graham Hambly and Son; Roy C. Castner, Parmalee-Dohrman Company; A. J. Hartfield, Pacific Gas Radiator Company; H. L. Boyd, Secretary Retail Hardware Dealers' Association of Southern California.

Membership Campaign Due

A membership campaign is about to be launched to bring retail and wholesale gas appliance dealers throughout Southern California into affiliation with the Association. The Southern Counties Gas Company and the Southern California Gas Company have volunteered the services of an employee in each of the towns outside of Los Angeles that they service, to act as secretary of the local units as they may be established. These local secretaries will take care of local correspondence and records, and will keep in touch with the central office in Los Angeles.

Regular meetings on the second Monday in each month will be held by the Los Angeles unit, and it is the plan of the directorate to engage representative authorities to present educational addresses along merchandising lines at the meetings. Arrangements will also be made to supply suburban units with speakers.

E. A. Norton, President
Gas Appliance Association of Southern California

Headquarters of the Association have been established at Room 500, 420 South Spring Street, Los Angeles, and the employment of an executive secretary became effective on July 1st. Since that time a constitution has been drafted, and in it are involved several features of general interest, as indicating the nature and purpose of the organization.

Constitutional Provisions

Article II of the constitution contains the objects of the Association which are: (a) to increase the morale of the gas appliance industry; (b) to establish a spirit of co-operation between gas utility companies, manufacturers, wholesalers, and retailers of the gas industry; (c) to stand ready to co-operate with the American Gas Association and the Pacific Coast Gas Association; (d) to improve the standard of and promote the safe use of gas appliances; (e) to disseminate information that will be helpful to one another in the successful conduct of gas appliance business.

Membership, under the constitution, is divided into nine classifications: gas utility companies, Class A; manufacturers of gas appliances, Class B; jobbers and wholesalers of gas appliances, Class C; manufacturers' agents, Class D; department stores and large furniture and hardware dealers, Class E; dealers in gas appliances, Class F; associate members, Class G; honorary members, Class H; non-resident members, Class I.

Underlying Causes

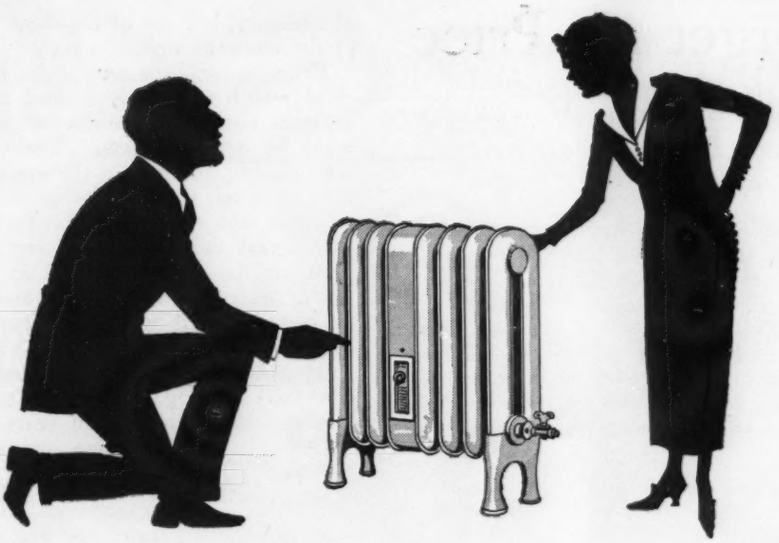
The objects of the Association as quoted above from the constitution, reveal the purpose of its foundation, but more might be added as to the underlying causes which prompted the forming of such an organization in Southern California.

For the past several years it had been forcefully brought to our attention that the gas appliance business in general was not in a profitable condition, owing in part to an undercurrent of price-cutting, which resulted in all manufacturers being constantly importuned by their distributors for lesser prices. As is the case in all instances of this kind, the consuming public has been made to bear the brunt of this demoralized condition. We in the Southland have been forced to receive and market inferior goods, and the public has had to accept merchandise that was not worth the prices paid.

An Illogical Situation

The motivating force behind the Association is the desire to educate the consuming public and the retailer to the purchase and sale, respectively, of heat, satisfactory cooking, and longevity. In New England towns, where 85 per cent of the population are wage-earners, the resale price of gas ranges is more than twice the resale price of those sold in Southern California, and it goes without saying that the consumer receives an article far superior in value to the one received by the consumer in Southern California. This condition is highly illogical and the Association aims to do

(*Continued on Page* 58)



Make More Money

by Concentrating on a Complete, Fast Selling Line!

You can make more profit by concentrating on Pacific Gas Heating Appliances, thus cutting out numbers which duplicate each other and eliminating slow-moving merchandise. It is the merchant who standardizes on a few well-advertised, favorably-known brands who makes the most money.

The Pacific line is complete. A gas heating unit for every possible need in homes, stores, office buildings, schools, churches and factories. Both vented and non-vented appliances. Superior features have resulted in over 250,000 satisfactory Pacific installations.

There are hundreds of Pacific units in use in your neighborhood. And the Pacific Gas Radiator Company is continually telling the public about Pacific products through persistent advertising.

Write for Agency Proposition

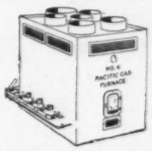
The Pacific Line

is complete. Every type of gas heating appliance is available. Below are a few examples:

Radiators

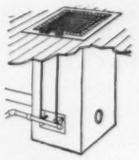
Pressed Metal Radiators are the least expensive—and often the best—type of gas heating. Pacific radiators are made vented and unvented, of strong rust-resisting metal. Exclusive air circulation system reduces gas bill 25%. Illustrated above.

Warm Air Furnaces



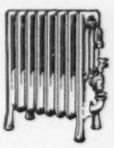
Concealed below the home, these units are operated by upstairs control. Maintain even temperature automatically.
The ideal heating system for Western homes.

Floor Furnaces



From two to five rooms may be heated with warm fresh air by a Pacific Floor Furnace. Air is drawn from the outside and an exclusive circulation system heats it quickly, saving gas consumption.

Gas-Steam Radiators



An individual steam heating plant—automatically regulated. The most efficient system for large buildings.

Radiant Heaters

Pacific and other makes. Inexpensive installations.

Pacific Gas Radiator

Gas Heating Company *Headquarters*

General Offices—1740 West Washington St., Phone BEacon 2190
Downtown Display—616 W. 8th St. Factory—7541 Roseberry St., Los Angeles, Calif.
Representatives throughout the West

Sell *the* Idea--Forget *the* Price

A. L. Crane Points Out the Road that Successful Merchandisers Must Follow; Special Discounts Do Not Close Sales

By H. Elliott Taylor

WORN out and weary, sad and bedraggled, hopeless and helpless, the age-old argument *Price Reduction* totters into your showroom and tries to turn over a little business for you. Day after day he putters back and forth among your appliances, gets in everybody's road, upsets your sales plans and misplaces your profits. But still he clings on. "What are we going to do with a faithful old plug like this?" you ask. "He has been here so long we feel sort of attached to him; maybe we would get someone worse if we let him out."

Do anything you like with him, says Al Crane, except one thing. Don't allow him to hang around your place of business under the guise of a sales assistant. For in the final analysis *Price* is the last feeble argument of an ineffectual sales appeal.

Real Appeal Neglected

"Too long," Mr. Crane points out, "we have pinned our faith and our hopes upon the miracles that could be accomplished by a $5 reduction. We have neglected the strongest appeals that could be made to the woman in the home."

Think of the irresistible argument that can be presented on the subject of cleanliness and convenience in a kitchen where coal or wood is being used as a fuel. Consider for a moment the economy of operation and the improvement in cooking results, where a new up-to-date appliance is being advocated to replace antiquated, inefficient equipment.

A Pleasant Kitchen

Visualize, if you will, the appeal that can be made by pointing out how the color scheme of the kitchen can be improved to make it a pleasant workroom instead of a place of drudgery and confinement. The kitchen is the living and working room of the housewife of any family of moderate means. Of course the woman is interested in improving her working conditions, and the husband is by no means desirous that his helpmate spend all of her time working with makeshift equipment.

The truth of the matter is, many people who could well afford the latest refinements in gas appliances, and who could readily be sold on their advantages, do not even know that they exist. The only argument they have seen for modern kitchen equipment has been that during this or that week, or for some reason or other, a few dollars have been knocked off the original sales price.

The public mind is confused on the value of gas as a fuel. In some quarters they have even come to regard it as a waning industry, clinging on to the thin edge until the day when electricity will completely supplant it as a fuel.

Sell Gas as a Fuel

It is well within the province of every gas appliance dealer to acquaint his customers with the true facts in the case. Gas is not a fuel of the past, due for a swift and early ride on the toboggan. And it is not a competitor of electricity. Gas and electricity are fundamentally partners. Only here and there do we find occasional overlapping of these two fields, and the public should not be allowed to think of them as competitive fuels.

Other Industries Lead

Other industries have already pointed the way. Clothing manufacturers do not continually harp on the one string, *Price;* rather, they feature style and serviceability, and the economic advantage of being well-dressed on all occasions.

Automobile dealers have not led us into a tiresome and lengthy discussion of how much this or that car will relieve the pressure on the family pocketbook. Instead they have painted wonderful and appealing pictures of the joys of motoring. They have built up in the American public the idea that every man in the country is looking forward to the day when he can own a car, and every present car-owner is looking forward to something better.

These two great industries are typical examples. One has sold the idea of being well dressed, knowing full well that the actual sales of suits would take care of themselves. The other has made all of us potential motor enthusiasts, strong in the realization that with this point driven home, automobile turnover would increase in direct proportion.

"Sell the Idea"

If we are to successfully merchandise gas and gas appliances, we must turn our steps into the same road. Let us forget entirely that price exists. Let us point out to the woman the additional leisure that will be hers, if she has an oven regulator, for example. Let us arouse her enthusiasm over a kitchen tastefully decorated and carefully designed, so that it is not only a model of efficiency, but one of the show rooms of the house as well.

Price as an argument only reaches those who have already decided to buy. It does not create new customers or bring in new prospects. The woman who thinks she is not in the market for a stove never realizes that price reductions on stoves exist. It has been estimated that seventy-five per cent of the domestic gas equipment now in use is either inadequate or obsolete, and none of this potential market can even be touched by a straight price reduction.

It is thus that Mr. Crane analyzes the market for gas appliances, and he sees it through the eyes of years of experience in merchandising and selling.

"We must find the buyers' mind," is one of his favorite expressions. It matters little how pleased *we* are with a piece of equipment, or with a well thought out scheme to market it. If it fails to strike a responsive note in the mind of the customer all of the work of the manufacturer, all of the work of the dealer and all of the work of the public utility company is wasted.

CALIFORNIA TWIN CITIES NOW SERVED FROM NEW HOLDER

A new 100,000 cubic foot holder has been erected by the Pacific Gas and Electric Company for the service of California's twin cities, Grass Valley and Nevada City. The holder is 76 feet high and 55 feet in diameter, requiring 226,000 pounds of steel in its construction. It is a far cry, says L. H. Hartsook, district manager of the Pacific Gas and Electric Company, from the little gas plant built in Grass Valley in 1862 to the service of today. Gas was made then from pitch pine and Australian coal, and the price ranged around $10 a thousand cubic feet, as compared to the present 86 cents to $1.85 a thousand price.

LARGEST GAS UTILITY SYSTEM

Public Service Electric and Gas Company of Newark, N. J., enjoys the distinction of having created in New Jersey the largest system in the world for generating and distributing manufactured gas. Nothwithstanding its record size, however, this system is constantly being enlarged and extended to meet ever-increasing demand for gas in household and industry.

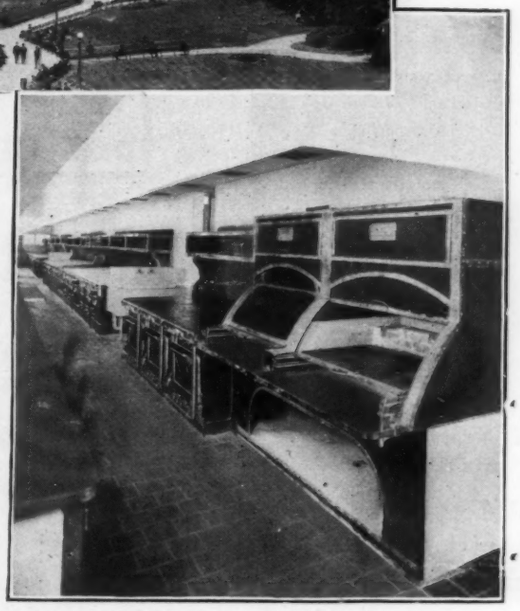
NEW MONEY FOR UTILITIES

The sum of $711,314,755 in new money, or at the rate of $4,742,098 per day, was obtained from investors by the public utility companies of the country for the first five months of 1925. This is $488,020,255 more than the railroads received and only $172,372,093 less than was invested in all other classes of industry with the exception of railroads. It was also $22,748,305 more than was invested in public utilities during the same period in 1924.

NEW SAVING IN GAS

There is no end to economies. Now comes word that square cooking utensils have been invented by a woman. Four of these utensils can be placed over a gas burner at once, and a material saving in gas bills thus realized.

THE T. G. ARROWSMITH CO.



THE ST. FRANCIS HOTEL

SAN FRANCISCO, CALIFORNIA

Selects the Sexton Patented Hotel Gas Range

It is significant of SEXTON superiority that the famous St. Francis Hotel of San Francisco should choose SEXTON Patented Hotel Gas Ranges in preference to all other types and makes, sending across the entire continent to obtain them.

The service maintained by this hotel is of the very highest order, so in the selection of ranges it is only natural that the SEXTON would be their choice.

THE S. B. SEXTON STOVE & MFG. CO.

T. G. Arrowsmith Co., Pacific Coast Representatives
135 New Montgomery Street
San Francisco

American Chemical Society Meets

MEMBERS of the western gas industry will find several points of interest in the August 3 to 10 session of the National American Chemical Society, being held at the Biltmore Hotel, Los Angeles, Calif.

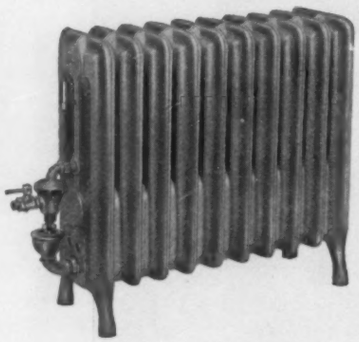
All branches of chemistry are represented in the Los Angeles convention. Seven sections are meeting separately at the same hours for consideration of specialized problems, according to Mark Walker, secretary of the Southern California section of the society.

Of Interest to Gas Men

Of outstanding importance to gas men are the joint meetings of the gas and fuel chemistry division and the petroleum division. During these sessions Walter M. Berry, engineer for the California Gas Research Council, and C. C. Brown, gas engineer for the Railroad Commission of the State of California, will present a paper on "The Fuel Oil Situation as It Affects Gas Company Operation in California." Another paper on "The Use of Oxygen in the Manufacture of Water Gas," offered by F. W. Parr and F. E. Vandaver, will also command considerable interest.

The plan of the convention is to devote mornings from 9 to 12 to sessions; afternoons to scenic trips, and evenings to entertainment. The address of W. R. Whitney, head of the research department of the General Electric Company at Schenectady, New York, on the subject: "Matter, What is there in It?" is one of the convention highlights.

The Latest Improved



Hammel

Gas Steam Radiators

Unit System of Heating—Steam Heat in Ten Minutes

IN WARMTH and beauty *The Hammel* excels all others. Its nickel plated fittings, the balanced adjustable type regulator, the once a year water feature, the no vent requirement, in conjunction with many other distinctive features, all combine to win approval of the most critical person.

WE ARE now able to offer some very profitable territory to dealers who can qualify. The *Hammel* line offers a very liberal profit and its repeat orders will build a substantial business for you.

Good Territory for Live Dealers

Write for Literature

Hammel Radiator Corporation

715 South Figueroa Street **Los Angeles**

Made in Los Angeles

Course *of* Study *for* L. A. Gas & Electric Corp.

THE Los Angeles Gas and Electric Corporation is at present conducting a course of study which is to be concluded early in August with an examination for which twenty desirable prizes have been offered, the foremost of which is a free trip to the Portland convention of the Pacific Coast Gas Association.

Subjects Covered

Enrollment is entirely voluntary and is open to employees of all department, and so great was the interest aroused that 587 men and women signed up as contestants. The subjects being covered by the course and examination call for a general knowledge of corporation activities and business routine, elementary knowledge of gas and electric manufacture and distribution, the Corporation's Year Book, Manual of Standard Practice, Pension System, Employees Mutual Insurance Fund, gas and electric meters, principles of rate making, etc. Lectures are given every week on these various subjects and those entered in the course are taken on trips through the gas and electric plants for first-hand observation.

Competition Strong

Interest runs high and competition is keen, especially for the coveted Portland trip. Company officials are very much gratified at the heavy enrollment and the great interest displayed by the employees in learning everything possible about the workings and problems of their company regardless of the department in which they may be employed. In fact, the examination contest has really developed into a course of study, and those entered in it have really taken on the name "students" instead of merely "contestants" for prizes.

Annual Convention *for* A. G. A.—Oct. 12

FOR the seventh time since its organization the American Gas Association will gather in convention, the meeting this year to take place at Atlantic City the week of October 12.

The dominant thought of this year's convention is to be "the future of the gas industry," according to information issued by the headquarters office of the Association.

Large Exhibit Arranged

In connection with the annual convention there is regularly held a "gas style show", as the gas exhibit department has been termed. This year 257 booths are available on the Steel Pier at Atlantic City, and 168 exhibitors had already contracted for space at last notice.

Program plans as outlined promise some rare inspiration to those able to attend. General sessions will be held mornings and sectional afternoon meetings will be given over to discussion of specific detailed problems of the industry. One feature will be a public relations symposium. A national conference on information committee work will also be held during the sessions, under the auspices of the publicity and advertising section.

C. & G. COOPER CO. ENGINEER STUDYING COAST CONDITIONS

B. C. Thiel, assistant chief engineer for the C. & G. Cooper Company of Mt. Vernon, Ohio, is on the Coast studying the needs of local gas and oil fields.

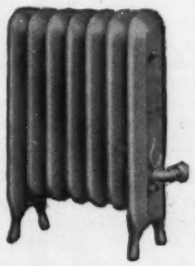
POTTER Heating

For many years POTTER Engineers have pioneered the way in the advancement of modern Gas Heating Systems. They have developed Gas Heating to such a degree of perfection that today, POTTER Products have become a standard of comparison wherever dependable, safe, economical and healthful gas heating is discussed.

OUR BEST ASSET

The tens of thousands of satisfied customers that our Organization has made through POTTER Gas Heating installations, is a JUST tribute to a satisfactory product—a gratification to conscientious effort.

THERE ARE MANY REASONS WHY IT IS BETTER TO HANDLE POTTER SYSTEMS

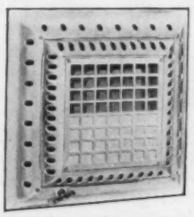


POTTER Vented Radiators

Only POTTER has these 7 POTTER Features

(Cast Iron and Steel-Made)

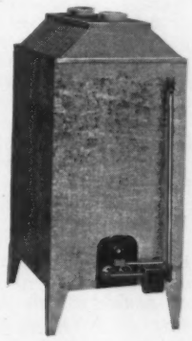
1. Condensation abolished. This does away with corrosion. Many years are added to the life of the Radiator.
2. Triple Circulation. The heat goes into the room, not up the flue.
3. Uniform warmth distribution. The air is never "cooked."
4. Quick heat. No other radiator heats so quickly as the light, efficient POTTER Steel-Made.
5. Aristocratic appearance. The POTTER Cast Iron Radiator is selected for the finest and largest homes.
6. Totally odorless always.
7. Not expensive.



COLE Floor and Wall Heaters

Made in heavy solid cast aluminum.

COLE is the only furnace manufactured that can be installed on either the first or second floor.



"MAGIC WAY" FURNACES

"MAGIC WAY" was the first, and has always been considered the leading Unit System of heating.

The principal of Unit Heating of modern buildings, brought to its present state of refinement through the study and efforts of this Organization, is based on the principle of an individual furnace or heater for each room or group of rooms to be heated.

This type of installation allows accurate temperature control in each room, regardless of the demand in other sections of the home. POTTER quantity production now makes "MAGIC WAY" with electric controls, available to anyone who can afford a gas furnace system.

The same features that make these well known POTTER-made appliances favorites with home builders and home owners, make them popular with churches, schools, theatres, auditoriums and factories.

The low cost of adequate heating by means of "MAGIC WAY" Vented Furnaces of either the Unit or Central Plant type, will be a revelation.

"MAGIC WAY" VALVES

By merely pressing a button, the temperature of any room may be regulated. This valve not only turns the heat on but it regulates the heat to suit your exact wants.

The HALL Floor Furnace

When the furnace type of heat is desired at low cost or when a basement is not available, use HALL Vented Floor Furnaces.

Potter Heating Now Includes:

"MAGIC WAY" UNIT FURNACES
POTTER GAS RADIATORS
RA DO GAS RADIATORS
HALL GAS FURNACES
"STEEL-MADE" GAS RADIATORS
COLE FLOOR AND WALL FURNACES

There Is a **POTTER System** for Every Need

POTTER RADIATOR CORPORATION

San Francisco—Oakland—Los Angeles—San Diego

Successful Merchandising Practice *Is* Discussed *by* Authority

A REPRESENTATIVE of *Western Gas* recently had the pleasure of meeting the representative of a local financial corporation who comes in contact continually with retail dealers and merchants in California. Some of the statements which he made deserve to be passed on to our dealer readers, for their sound recommendations for profitable merchandising.

Unprofitable Practices

He says: "There are far too many selling merchandise under misrepresentation and at prices that interfere with profitable and successful business. Some dealers who would otherwise be good and successful merchants, fear the other fellow and the prices he quotes. They also fear the customers who have been educated to offer ridiculously low prices for good merchandise. The dealer who caters to this class of trade is usually on the way to failure and seldom realizes it until it is too late. It is much better for a conscientious dealer to ignore undesirable competition and devote all of his thought and time to selling good merchandise at a fair profit to the customer who is willing to pay for what he gets and who may expect and receive service that will be satisfactory to him, and that will leave him in a frame of mind to recommend freely and voluntarily to his friends the dealer who has rendered him the service.

A Boost for Advertising

"Legitimate advertising that is lived up to builds enduring business. It establishes confidence. Too much cannot be said in favor of it. Favorable personal contact between a dealer and his customer, continued courteous treatment, pleasant adjustment of differences, even though they are sometimes not quite fair to the dealer, build the confidence of a desirable clientele that will lead to inevitable success. A large majority of substantial people will always prefer to pay a legitimate price for good merchandise and feel that they will receive proper service and attention, rather than to deal under conditions where confidence is not merited. Conscientious service rendered to desirable customers is one of the best paying assets of any dealer. It is most important, and positively necessary, to insure success.

Know Your Overhead

"A large percentage of failures are due to the fact that the dealer does not know what his own overhead expense is. He should always know this and add this expense to the laid down cost of every article, figuring his selling price accordingly. Many dealers never know why they fail in business; yet the fact remains that it is usually because they do not get a sufficient profit on the merchandise sold.

"About a year ago I had occasion to call on a dealer who was very much concerned because there were two competitive stores in the same block selling merchandise at prices so low that he wisely hesitated to meet them. My advice to this dealer was to continue to get a living price for his wares and forget the existence of the other stores. Today, both of the other stores are out of business and the dealer mentioned is in a good, healthy, condition and discounts all of his bills, and this notwithstanding the fact that general business has not been any too brisk. This is surely convincing proof that giving merchandise away is folly.

A Sufficient Mark-up

"For several months I called on another dealer who watched his overhead closely and yet was unable to pay his bills when due and profit by the cash discounts. When I suggested that his mark-up was not sufficient, I was told that if prices were increased he might as well close his doors. I then suggested to him that every other or alternating item on his floor be re-marked, increasing the selling price by 20 per cent, for at least one month as an experiment. I explained that by this process, at the end of the month he could know the number of articles sold at the narrower margin, as compared with those sold at the increased margin of profit. The result was so gratifying to the dealer that he today marks everything at a minimum of 20 per cent higher than formerly, takes and earns his cash discounts as his bills payable become due, and he hypothecates a very small percentage of his accounts receivable.

"These two cases are only examples of many, many, who have had the same experience."

Do You Practice These?

The substance of this financial corporation representative's advice to those who would make a success of retailing might be embodied in a few of his epigrammatic statements:

"It is not necessary to give your merchandise away. Cater only to the customer who will pay you a fair profit.

"Never misrepresent.

"Never talk ill of your competitor.

"Never make promises that you cannot keep.

"Buy the merchandise that your trade will appreciate.

"Be pleasant with your customers whether you feel well or not.

"Always give good service, and you cannot but succeed."

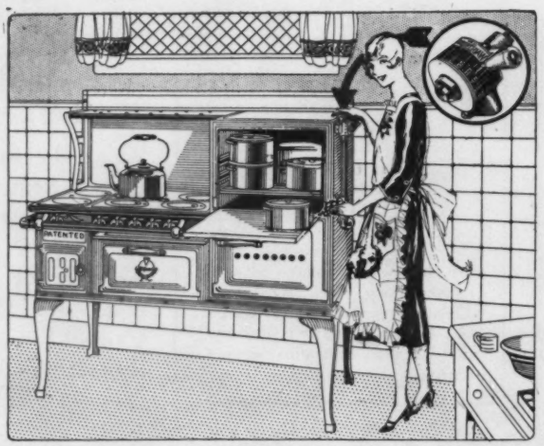
Wedgewood

QUALITY FUEL ECONOMY SERVICE

REG. U.S. PAT. OFF.

Already preferred by most western women because of its labor-saving features, appealing beauty and economical operation.

In half a million western homes the name WEDGEWOOD is synonymous with easier, better cooking and perfect baking.



Oven heat control, smooth, closed cooking top, rust-proof oven linings, cast-iron front and porcelain enamel finish, all have a definite meaning to gas range buyers these days.

James Graham Manufacturing Co.

695 Bryant St., San Francisco Factory at Newark, Cal.

Wedgewood Parts Always Obtainable

CASINGHEAD DEPARTMENT

On May 1st, 1925, a casinghead gasoline department was established by the Standard Oil Company of California. This department handles the collection, conservation and processing of casinghead gas and gasoline and the marketing of the resultant natural gas. This work was formerly handled by the producing department of the company, but due to the development of this phase of the oil business, it was felt that the creation of a separate department was advisable.

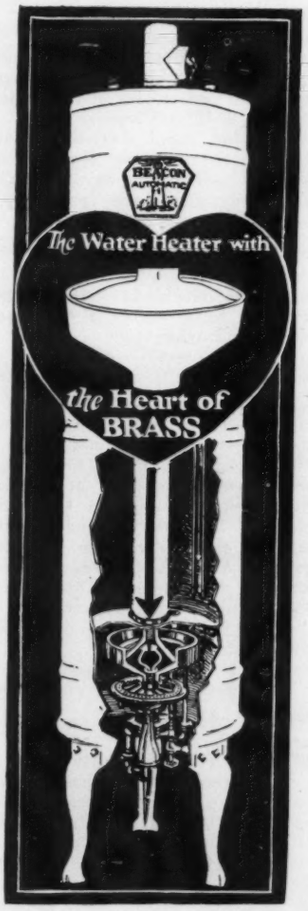
The department is under the direction of R. A. Halloran, manager, and Ross McCollum, assistant manager. Mr. Halloran has had many years' experience, especially in the development end of refinery operations. Mr. McCollum was formerly chief chemist of the producing department. These men have under their jurisdiction an adequate field and office staff. Activities include among other things the operation of eleven compression and absorption plants in Southern California fields and nine in the San Joaquin Valley. These plants range from 40 to 4,000 horsepower.

GASSER IN WYOMING

The Mack Oil Company, Fremont County, Wyoming, has completed a 30,000,00 cubic foot gasser on the Sheldon Dome, about 50 miles north of Riverton. The gas was found at a depth of 3700 feet.

A Water Heater you will take pride in selling

This quality product is a genuine business-getter. Every installation means additional sales, for it makes a life-long friend of every customer and they, in turn, recommend it to their friends. Gives an abundant supply of piping hot water any minute of the day or night. The instant the tap is turned hot water begins to flow at the same rapid speed as the cold water.



BEACON
Automatic Storage GAS WATER HEATER
"With the Enduring Heart of Brass"

This heater is backed by twenty-five years experience in the water heater business and embodies the latest developments in water heater construction. Made in four distinct models and a complete range of sizes.

All Beacon Automatic Models Have These Advantages

Brass Heating Element
Has six times the heat conductivity of iron. Stronger and more enduring than copper. Keeps water clean. Heats water quicker and with less cost for gas.

Substantial Construction
The Beacon is a heavy duty appliance. High grade materials are used throughout. The boiler is made of specially heavy gauge galvanized iron, and all seams are both riveted and welded. The patented center flue is made of seamless drawn boiler tube—not ordinary pipe. Maximum amount of heating surface is provided—hence less gas is consumed to obtain a given quantity of hot water.

Efficient Burner
Specially constructed to secure greatest efficiency. Cannot back fire.

Inner Burner
The pilot light of the Beacon Water Heater, also acts as a burner. It heats the water and maintains the temperature. Thus there is no gas consumed solely to light the main burner. The inner burner cannot clog nor blow out.

Draft Regulator
This patented feature makes the Beacon absolutely safe. It automatically operates a safety check valve against down drafts and therefore prevents any possibility of extinguishing the pilot light.

Maintains Water Pressure
The Beacon Water Heater gives a steady, even flow of hot water to the bath, shower, laundry tray or sink. Pressure is same as for cold water.

Guarantee
One year from date of installation.

If the Beacon Water Heater is not sold in your locality, you may secure a valuable franchise by writing now

BEACON
LIGHT COMPANY

Everything Gas and Electric

716 South Hill St
Phone TR 3841

Los Angeles, California

The California

Hot Water in One Minute

Two Sizes for 30 to 60 gallon tanks.

Two Colors, Black Japan or Gray Enamel

A Western Product

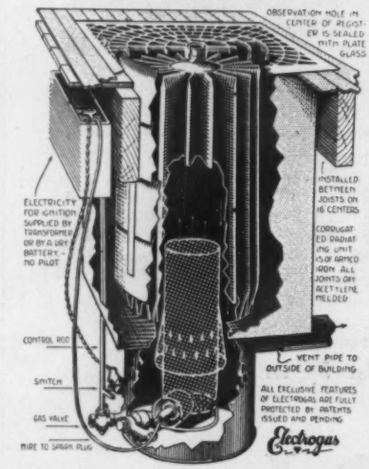
Sold Through Dealers Only

Manufactured by

Western Sheet Metal Works

1911 Mission St. San Francisco

Electrogas


OBSERVATION HOLE IN CENTER OF REGISTER IS SEALED WITH PLATE GLASS
INSTALLED BETWEEN JOISTS ON 16 CENTERS
ELECTRICITY FOR IGNITION SUPPLIED BY TRANSFORMER OR BY A DRY BATTERY - NO PILOT
CONTROL ROD
SWITCH
GAS VALVE
WIRE TO SPARK PLUG
VENT PIPE TO OUTSIDE OF BUILDING
ALL EXCLUSIVE FEATURES OF ELECTROGAS ARE FULLY PROTECTED BY PATENTS ISSUED AND PENDING
Electrogas

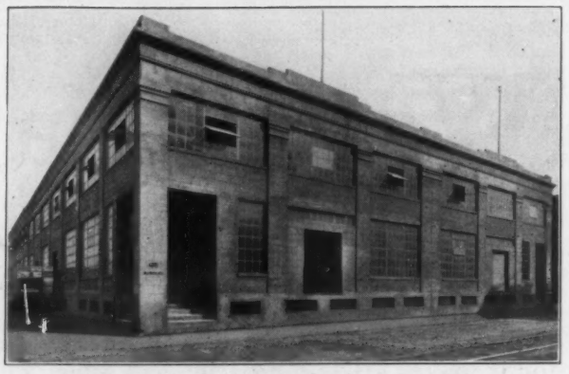
The electrically lighted floor furnace

KAUFFMAN-NORTON CO.

Rialto Building, San Francisco, Calif.

WANTED

Young man with experience in Oil Gas Manufacture and High pressure distribution as assistant to manager of small plant in Panama. State experience and salary expected. Box A, care *Western Gas*.



New San Francisco Home of C. B. Babcock Co.

New Quarters *for* C. B. Babcock Co.

CONSOLIDATION of the operating departments of the C. B. Babcock Company, San Francisco, manufacturers of the Babcock High Efficiency Gas Furnace, and Pacific Coast distributors for the Roper Gas Range, has recently been effected in the moving of the executive offices of the company to the new building at 135 Bluxome Street, San Francisco.

The building, which is a modern fireproof structure of reinforced concrete, has been occupied as a factory and warehouse since August, 1924. The total floor area available in the two stories and basement of the structure is 22,000 square feet. Excellent facilities for rapid distribution are available from the new location, and the move, according to the company, has taken place without any disturbance or interruption of production.

EMPLOYEES' HANDBOOK FOR PACIFIC GASOLINE CO.

The Pacific Gasoline Company of Los Angeles has under way the preparation of a handbook for company employees. The book, which will be ready for distribution some time before fall, covers a wide range of subjects, among which may be mentioned: Standard operating practice. Standard construction practice. Laboratory manual. Safety and fire prevention. Plant inspection and classification. General catalogue of rules and bulletins. Company-employee cooperative activities. Explanation of suggestion system. Description of training squad plan. Rules governing occupancy of buildings. Rules governing use of company automobiles.

ELECTED VICE-CHAIRMAN

At the Milwaukee convention of the National Purchasing Agents' Association, held May 25 to 28, inclusive, N. L. Morse, purchasing agent of the Southern California Gas Company and the Midway Gas Company, was elected to the vice-chairmanship of the public utility group.

The National Purchasing Agents' Association has a membership of about 5,000, of which 1100 to 1200 were present at the national convention. Mr. Morse was unable to make the trip to Milwaukee, though he has attended most of the previous national meetings. As vice-chairman of the public utility group he will have charge of the Pacific Coast activity of the Association.

"A SIGN OF PROGRESS"

Improvements to the extent of $20,000 in the Petaluma, Calif., distribution system of the Pacific Gas and Electric Company are under way, and will occupy about three months time for completion.

A novel feature of the Petaluma betterment project is the caption, "A Sign of Progress", which appears on all of the trench barriers which are used for safety purposes in connection with the work. They are occasioning much favorable comment in Petaluma, according to a late issue of the Petaluma Courier.

GAS UTILITIES RECOGNIZED IN EDUCATIONAL WORK

Special courses in gas engineering are being offered at several institutions, some of them correspondence courses. A five weeks summer course on gas production, distribution and utilization is being offered at Columbia University which, with the cooperation of the American Gas Association, is also planning a two-year correspondence course on this subject. Another correspondence course is being prepared by the Pennsylvania State College on Public Utility Economics.

ANOTHER EARTHQUAKE FREAK

Recent severe earthquake shocks produced startling effects upon Atlas No. 6, a well in the Sunset Field near Maricopa, belonging to the Atlas Oil Company. Before the quake the pressure increased to make the well flow 2,000 barrels of oil daily, with a daily gas flow of 2,000,000 cubic feet, which held for eight days. The well then sanded up, and on being cleaned out now makes a steady 1,000,000 cubic feet of gas, with a daily oil output of 700 barrels, compared with 400 barrels before the quakes.

INCREASE IN EARNINGS

The Canadian Western Natural Gas, Light, Heat and Power Company, Ltd., Calgary, Alberta, reports an increase of $271,199 in earnings for the six-month period ended March 31, 1925, over the corresponding period of a year ago. The earnings for the last six-month period were $881,203.

BIG GASSER IN MEXICO

The Mexican Gulf Oil Company's well No. 5 at Chapaco, Mexico, is reported to be making 5,000,000 cubic feet of gas at a depth of 1728 feet in the gray lime.

Western buyers read Western Magazines

A CAREFUL STUDY will prove conclusively the truth of the statement that there is a field and a need for Western trade papers. This truth applies as fully to the field of gas as to any other Western industry.

The Pacific Coast territory, because of its climatic conditions, fuel supply and distinct geographical situation, has problems affecting the industry which can only be solved by a Western medium. The rapid growth of the territory, and the tremendous amount of news which this development generates, give *Western Gas* a big opportunity to serve its readers.

The demand and the need for a Western trade paper insures to those advertising in it a degree of reader interest not usually obtainable. Every issue is read carefully from cover to cover, because it is the only means of keeping in direct contact with the special territorial developments of the Western gas industry.

WESTERN GAS

626 S. Spring Street
Phone BRoadway 3262
Los Angeles, Calif.

447 Sutter Street
Phone GArfield 2772
San Francisco, Calif.

Unaccounted-for Gas *is* Subject *of* Report

(*Continued from Page* 32)

for the year 1923-24 in order to illustrate the reduction in unaccounted for gas as the result of a systematic effort to locate and repair leaks. The results obtained are further set forth in a curve showing an increase in gas sales and a falling off in unaccounted-for gas.

The San Diego Consolidated Gas & Electric Company presents a report on four investigations on subjects more or less responsible for leakage.

First —The elimination of leaks at meter connections and seams on iron meters.

Second—The gas losses due to D. R. meters.

Third —A record on defective fittings.

Fourth—Observations on locating seams on steel pipe when laid.

The Pacific Gas & Electric Company presents an outline of procedure on premises survey inspection for leakage. This report also includes a suggestion on how to judge the volume of leakage formed by different size soap bubbles.

Excellent Analysis Presented

From the Portland Gas & Coke Company, an exceptionally good report is presented. This covers a complete analysis of the unaccounted-for gas for the year 1924, separating the various components. This is the first time such a record has ever been submitted to the Association. An explanation of each item is set forth in detail so that a similar record for comparison can be prepared by any other gas company.

This same company reports on a transmission line test to show the effect of pressure on leakage.

Another interesting record is test and inspection made on a Dresser Coupling line for leakage. This test is given in detail, both the procedure and results.

A survey made by this same company to determine the possible gas lost during construction is set up as a report.

Of Practical Value

The entire report of the committee on unaccounted-for gas is of practical value to the industry. It consists, as noted, of the work done by various gas companies along different lines. All such effort is set forth in sufficient detail so that the interested gas man may check his own efforts along any of the various surveys reported.

BACK FROM VACATIONING

C. B. Babcock, President of the C. B. Babcock Company, San Francisco, has just returned from a month of vacation in the Pacific Northwest.

Fruit Canning Stimulus *is* Used *to* Boost Gas Range Sales

By H. Elliott Taylor

WE don't have to consult the Advertising Primer to realize that a straw hat campaign in November and December would be something of a failure. The "call of the open road" copy that inveigles us into buying a car two years before we can afford it, doesn't do its calling during the months of snow and ice and rain and mud. And women's spring styles aren't advertised in spring. And why? Everybody knows, of course, advertising and sales promotion plans must be timely. Timeliness is the essence of any successful campaign. To a certain extent, then, every merchant is and must be an opportunist. He must be able to see every important event, every condition in his locality in relation to its bearing on his business.

A Natural Tie-Up

And now, in California in particular, nature herself is providing the merchandiser of gas appliances with a most excellent peg on which he can hang his propaganda for the sale of stoves. The California fruit crop this year is one of the largest in the history of the state. The peach crop will be twice as big as last year. This means, of course, that fruit will be low in price, for the canners cannot absorb the great extra production, and the general retail market will have to take up the surplus, or see a large part of the crop wasted. The fruit growers realize this, and in cooperation with many other allied interests, they are making a concerted effort to increase the per capita consumption of fruit by stimulating canning in the homes. Women's clubs, retail and wholesale grocers, the sugar industry and manufacturers of fruit jars and canning equipment are all working with the fruit growers in the campaign. Advertising and newspaper publicity will be directing the attention of all of the housewives of the state to the importance and desirability of home-canned fruit.

Appliance Society Campaign

What could be more timely then, than the Gas Appliance Society's campaign, now under way to urge all of its members, all of the stove dealers throughout the entire state, to take advantage of this splendid publicity, and then go one step further, and show the housewife the most modern, the most satisfactory way of canning, through the use of the stoves equipped with oven heat controls.

The Society is urging that every unit concerned hold special meetings at an early date and make plans for this event. It is suggested that wherever possible dealers put on a collective exhibit and demonstration, renting a vacant store, hiring a demonstrator and teaching the women the oven method by letting them do their own canning at the exhibit.

Demonstrations Timely Now

Demonstrations will be timely from now until the last of September, and every merchant knows when he can expect the maximum results from his own locality. This depends entirely upon when the bulk of the local crop will be on the market. But the Gas Appliance Society advises that its members make their big drive during the first two weeks in August. Where a plan of collective campaign cannot be worked out, the live dealer can have individual store demonstrations, utilizing the gas company's or manufacturers' demonstrators.

The newspapers are being supplied with special publicity material in regard to the fruit crop, and they are making use of it, for it is to the interests of the papers to see that the agricultural industry receives the fullest return for its product.

Another suggestion, emanating from the Society is to the effect that dealers should attempt to arrange for the banks to devote some of their window space to fruit and canning displays.

All of the local manufacturers and distributors of stoves are back of the campaign, and promise to assist dealers in every possible way to insure the success of the plan.

The importance of this campaign cannot be overestimated. It will result in a great service being done to the fruit industry, it will produce a greater volume of sales of modern cooking equipment, and it will mean just one more step in the education of the public on the versatility of gas, the ideal fuel.

Hiking to Portland

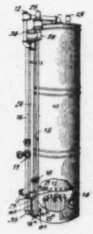
GAS IN GREAT BRITAIN

The gas industry of Great Britain today employs about 150,000 men and $800,000,000 of capital. It treats about 17,000,000 tons of coal a year and sells its output of gas to more than 8,000,000 customers.

THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

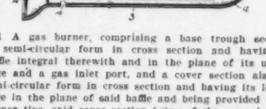
1,535,288 WATER HEATER. William E. Beilman, Buffalo, N. Y. Filed July 5, 1924. Serial No. 724,490. 2 Claims. (Cl. 236—20.)

1. In a water heater, the combination of a casing, a reservoir mounted in said casing, main and secondary gas burners arranged in the casing below said reservoir, main and secondary valves for controlling the supply of gas to said main and secondary burners, the secondary



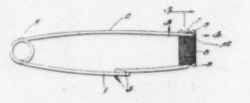
burner having an air inlet communicating with the atmosphere exterior of said casing, and thermostatic means for operating said valves.

1,533,909 BURNER FOR GAS STOVES. Ora A. Ferguson, Tulsa, Okla. Filed May 18, 1922, Serial No. 561,985. Renewed Mar. 5, 1925. 2 Claims. (Cl. 158—104.)



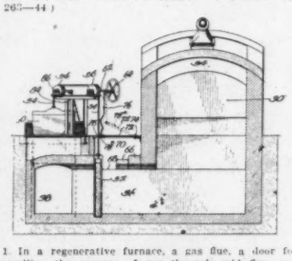
1. A gas burner, comprising a base trough section of semi-circular form in cross section and having a baffle integral therewith and in the plane of its upper edge and a gas inlet port, and a cover section also of semi-circular form in cross section and having its lower edge in the plane of said baffle and being provided with burner tips, said cover section being of the same length of said base section and forming therewith a burner of circular form in cross section, of which said baffle is diametric

1,533,913 GAS LIGHTER. Charles F. Larsen, Chicago, Ill. Filed Aug. 6, 1924. Serial No. 730,493. 2 Claims. (Cl. 67—61.)



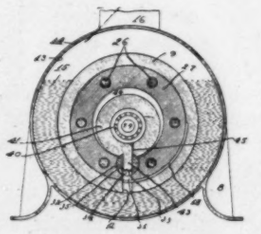
1. A gas lighter including parallel spring arms, the outer ends of said arms being disposed at right angles to the body portions, a cross-bar carried by the outer end of one of said arms, an outstanding finger at the outer end of the cross-bar, a substantially arcuate file plate mounted for lateral adjustment upon the cross-bar, means carried by the outstanding end of one of the arms and means carried by the outstanding arm of the cross-bar for guiding said plate in its movement and a detachable ignition tip carried by the outstanding end of the other arm for normal contact with one surface of the file plate.

1,531,392. AIR AND GAS VALVE MECHANISM FOR MELTING FURNACES. Aubrey J. Grindle, Chicago, Ill., assignor to Grindle Fuel Equipment Company, Harvey, Ill., a Corporation of Illinois. Filed Jan. 30, 1922. Serial No. 532,864. 5 Claims. (Cl. 263—44.)



1. In a regenerative furnace, a gas flue, a door for controlling the passage of gas through said flue, and adjustable means for admitting air in variable amounts into said flue to cool the door

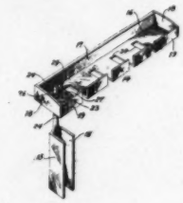
1,526,449. COMPRESSOR. Harold W. Wishart, Clinton, Iowa, assignor, by mesne assignments, to Climax Engineering Company, Clinton, Iowa, a Corporation of Delaware. Filed Feb. 2, 1922. Serial No. 533,735. 12 Claims. (Cl. 230—30.)



1. A compressor comprising a stationary housing containing a lubricant, a stationary casing projecting therein, a cylinder rotatable in said casing, a rocker in said cylinder, an eccentric in said cylinder rotatable therewith, and a vane on said eccentric having a sliding engagement with said rocker.

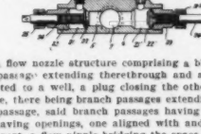
1,536,016. GUARD FOR GAS STOVES. Peter Kavanagh, New York, N. Y. Filed June 2, 1924. Serial No. 717,374. 8 Claims. (Cl. 126—42.)

1. In combination with a gas stove having burner cocks arranged along the front thereof, of a protector for said cocks including a pair of separable parts arranged at right angle to each other, means for attaching



one of said parts to the gas stove, and means for supporting the other part from said first part.

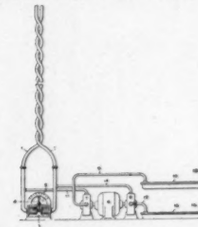
1,532,253. FLOW-NOZZLE STRUCTURE. William Meredith and Stephen A. D. Cox, Huntington Beach, and Walter L. Foster, Whittier, Calif. Filed Aug. 18, 1924. Serial No. 732,795. 6 Claims. (Cl. 166—15.)



6. A flow nozzle structure comprising a block having a main passage extending therethrough and adapted to be connected to a well, a plug closing the other end of the passage, there being branch passages extending from said main passage, said branch passages having outlet ports, caps having openings, one aligned with and facing each outlet port, a flow nipple bridging the space between each port and cap, said flow nipple being laterally removable, a valve for each branch passage, a gate valve in said main passage between said plug and the juncture of said passages, and a gate valve on the other side of said juncture.

1,531,[illegible]. METHOD AND APPARATUS FOR INDICATING VARIATIONS IN THE PROPORTIONS OF A GAS MIXTURE. Leland M. Willey, Schenectady, N. Y., assignor to General Electric Company, a Corporation of New York. Filed Oct. 13, 1920. Serial No. 416,735. 3 Claims. (Cl. 265—44.)

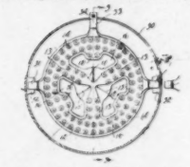
1. The method of determining variations in the amount of CO_2 in flue gas which comprises passing flue gas and air up two long vertical pipes under the same conditions as to temperature and humidity to



establish vertical columns in the pipes, and observing the relative pressures at the bases of the vertical columns.

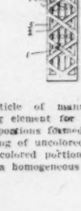
1,535,431. BURNER. Louis R. Mendelson, Cleveland, Ohio. Filed Apr. 21, 1924. Serial No. 707,916. 7 Claims. (Cl. 158—116.)

1. A gas burner, comprising a central portion, a marginal portion, and radially extending connecting portions, the upper wall of said central portion being provided with elongated depressions extending downwardly



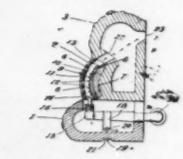
and outwardly from substantially the center of the upper surface of said central portion.

1,535,472. RADIATING ELEMENT FOR GAS HEATERS. Alfred H. Humphrey, New York, N. Y. Filed June 12, 1920. Serial No. 388,612. 2 Claims. (Cl. 126—92.)



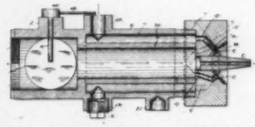
1. As an article of manufacture a fabricated tubular radiating element for gas stoves consisting of front and back portions formed of earthy material, the back portion being of uncolored material and the front portion having colored portions of the same material incorporated as a homogeneous part thereof.

1,533,391. RADIANT GAS LOG. James F. Conboy, East Orange, N. J., assignor to The Con-Den-Rit Radiant Log Corporation, Perth Amboy, N. J., a Corporation of New Jersey. Filed July 9, 1921. Serial No. 483,480. 3 Claims. (Cl. 126—92.)



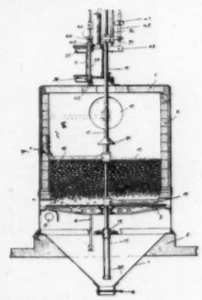
1. A gas log comprising in its construction a body having a lower member, an upper member and a recess in its front wall between the upper and lower members, a radiant back wall in said recess, a removable radiant front wall in said recess continuing the front of the body, and spaced from the back wall so as to form a combustion chamber therebetween, and gas burners leading into the bottom of the combustion chamber, the radiant front wall being formed with extensive and irregular longitudinal openings separated by a net work of irregular longitudinal ridges, so that the flaming gases issuing from the combustion chamber through the front openings will heat to incandescence the radiant back wall and the net work of radiant longitudinal ridges in the open-work front wall and highly effective heat rays as well as attractive light rays will thus be projected forwardly from between the upper and lower members of the gas log.

1,535,491 GAS BURNER. Howard W. Partlow, Utica, N. Y. Filed Sept. 20, 1924. Serial No. 738,864. 5 Claims. (Cl. 158—27.4.)



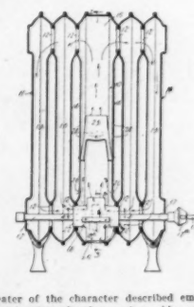
5. A gas burner comprising a cylindrical body having a central longitudinal air chamber extending therethrough, a throttle in one end of said chamber, said body being formed with an annular gas chamber surrounding the air chamber beyond the throttle and having a gas inlet, a cap for closing the opposite end of the body and for preventing the mingling of the air and gas within the body, the outer face of said cap having a cavity, and said cap having passages for conducting the air and gas from the respective chambers into the cavity to be mixed and consumed outside the body and cap, the discharge orifices of said passages being arranged in alternate order, and an elongated hollow deflector extending outwardly from the center of said cavity adapted for directing the flame away from the cap and for discharging a jet of air into the flame beyond said cavity.

1,531,857. GAS PRODUCER. Albert L. Galusha, Caldwell, N. J. Filed Nov. 11, 1922. Serial No. 600,234. 13 Claims. (Cl. 48—85.2.)



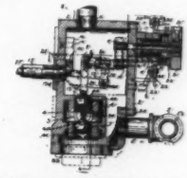
9. The combination with a fire box of a gas producer containing the fuel bed, of a rotary vertical shaft passing centrally through the same, a horizontal stirrer arm carried by said shaft, means for moving the shaft while in rotation vertically sufficiently to carry the said arm through substantially all parts of the fuel bed and means for reversing such vertical movement at any desired point.

1,535,412. GAS HEATER. August J. Hartfield, Los Angeles, Calif. Filed July 28, 1920. Serial No. 399,537. 4 Claims. (Cl. 126—91.)



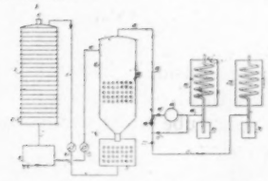
1. A heater of the character described embodying an upright combustion chamber and a side radiator element communicating therewith at its top; characterized by a combined burner and passage member located at said lower end communication and embodying a body having therein a burner chamber, a vertical air passage extending around the burner chamber, and a lateral passage that connects with the lower end of the radiator element and with an exhaust flue.

1,532,340. HEAT CONTROL FOR INDUSTRIAL OVENS. Howard W. Partlow, Utica, N. Y. Filed June 14, 1924. Serial No. 720,116. 9 Claims. (Cl. 236—15.)



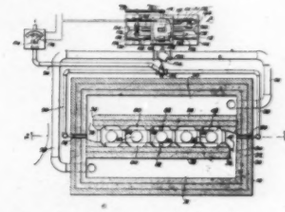
1. A heat governor, comprising a hollow body adapted to be charged with fuel gas to be delivered to burners for producing the heat, a primary gas receiving chamber within said body, a thermostat supported by one end of the body adapted to be inserted in the zone of the heat evolved by the burners, a mechanism for predetermining maximum and minimum degrees of heat to be controlled by the thermostat, located at the opposite end of the body, a pair of valves in said receiving chamber, said valves being flexibly and adjustably connected and being arranged for simultaneous operation for controlling the outflow of the fuel gas towards the burners, and a series of connected links interposed between and operatively connecting said thermostat and said predetermining mechanism with each other and with said valves.

1,533,773. GAS-PURIFICATION PROCESS. Frederick W. Speer, Jr. and Ralph E. Hall, Pittsburgh, Pa., assignors to The Koppers Company, Pittsburgh, Pa., a Corporation of Pennsylvania. Filed Dec. 8, 1921. Serial No. 520,895. Renewed June 5, 1924. 12 Claims. (Cl. 23—10.)



4. The process of removing hydrogen sulphide and carbon dioxide from gases, which consists in: passing a gas containing such constituents into contact with a sodium carbonate solution to absorb the hydrogen sulphide and carbon dioxide from the gas; and then subjecting the solution containing the absorbed impurities to heating under vacuum to expel the bulk of hydrogen sulphide from the solution; substantially as specified.

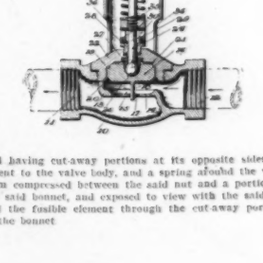
1,535,277 FURNACE. Carl J. Wright, Toledo, Ohio, assignor to Doherty Research Company, New York, N. Y., a Corporation of Delaware. Filed May 6, 1921. Serial No. 467,250. 8 Claims. (Cl. 263—14.)



1. In a furnace of the class described, an elongated combustion chamber constructed to contain a plurality of crucibles, means for introducing gas into the ends of the chamber, means for pre-heating the air which is used to support combustion in the chamber, means for reversing the flow of air and gas through the combustion chamber, and devices extending inwardly from the walls of the combustion chamber and acting to direct the burning gas into close contact with the crucibles in the chamber.

1,532,615. AUTOMATIC CUT-OFF AND CUT-IN VALVE. Edwin Cooper Wells, East Orange, N. J. Filed Feb. 29, 1924. Serial No. 696,012. 5 Claims. (Cl. 137—102.)

3. A cut-off valve including a valve body having vertically spaced valve seats, a valve member guided therein and shiftable between the said seats, a valve stem extending through the portion of the body adjacent to one of the seats and having connection with the adjacent side of the valve member, a fusible element around the valve stem exteriorly of the body, a valve stem guide in connection with the body forming a flat seat for one end of the fusible member, a nut against the other end of the fusible member having a threaded connection with the valve stem, a bonnet extending from the valve body, having a guide for the outer portion of the valve stem



and having cut-away portions at its opposite sides adjacent to the valve body, and a spring around the valve stem compressed between the said nut and a portion of the said bonnet, and exposed to view with the said nut and the fusible element through the cut-away portions of the bonnet.

Testing Natural Gas *for* Gasoline

(*Continued from Page* 43)

being closed at end and perforated with ten 1/16″ holes on the under side.

D. Gas outlet connection flush with underside of the top head of absorber.

E. U-Gauge—preferably of the pressure, enclosed type.

M. Meter—If an orifice is used instead of a direct meter, then for convenience it should be calibrated at a certain U-gauge pressure to deliver the gas at a fixed rate.

3. Distillation Apparatus

(Refer to Diagram No. 3)

A. *Flask*

Standard 1,000 c.c. Engler Distillation flask.

Dimensions—Diameter of bulb (outside), 5″—¼″ tolerance. Diameter of column (inside), between ⅞″ and 1″.

Length of column, 6″—¼″ tolerance.

Vapor tube to be connected in middle of column.

B. *Condenser*

A. S. T. M. standard gasoline distillation condenser described in Bureau of Mines Technical Paper 323A, p. 48. In addition a small vapor tube should be soldered on condenser just above the outlet, in such a way that un-condensed vapor may be removed without trapping condensate.

C. *Thermometer*

A. S. T. M. Low distillation as described in Bureau of Mines Technical Paper 323A, p. 48, range 30° F. to 580° F.

D. *Cones*

To remove mechanically entrained liquids from hot vapor, made of 14-20 mesh brass or nichrome gauge. Cone dimensions 1″ diameter, 1″ long.

E. *Receiver*

A graduate cylinder shall be used for a condensate receiver. The receiver shall be equipped with a rubber stopper through which the condenser outlet extends. The receiver shall be surrounded with an ice bath.

F. *Barometer*

Not shown.

G. *Hydrometer*

For determination of A. P. I. gravity of absorbing oil. Not shown.

H. *Thermometer*

For determination of gas temperature, and for determination of temperature of ice bath. Not shown.

I. *Meter*

Not shown.

4. Operations of Test

A. *Procedure for Absorption*

One and one-half gallons of the absorbent oil are placed in each absorber.

The several parts of the apparatus are set up as shown in diagram No. 2, connection being made at valve F., with the gas supply to be tested. All connections are made leak-proof and needle valves G, H, I, J, K, and L, are tightly closed. Valve N is opened. Meter reading is taken. Valve F is then opened.

Record the pressure shown on the gauge and the time. Open needle valve G carefully and slowly to its capacity. When the pressure shown on Absorber No. 1 equals the well or line pressure, as shown by no further passage of gas through the oil, needle valve H is opened slowly to its capacity. Needle valve I is next carefully opened until the pressures are equalized, then valve J is opened, and valve K is slowly opened until the pressure in all three absorbers is the same as the line pressure. Needle valve L is opened slightly, attention being given to the level of the mercury in the U-gauge. The rate of gas flow

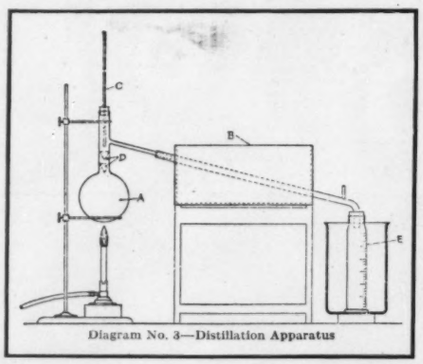


Diagram No. 3—Distillation Apparatus

must now be so regulated by manipulation of the valves L and N so that:

(1) There is a differential of 1″ of mercury shown on the U-gauge; and

(2) The rate of flow shall be as per the following schedule, depending upon the pressure under which the test is being conducted.

1. 15 cubic feet per hour at atmospheric pressure.
2. 30 cubic feet per hour at 15 lbs. gauge pressure.
3. 45 cubic feet per hour at 50 lbs. gauge pressure.
4. 60 cubic feet per hour at 120 lbs. gauge pressure or higher.

Place thermometer in the thermometer well and shortly thereafter record the gas temperature. The temperature of both gas and oil at the time of test should be 60° F., with an allowance of 5° F. above or below.

Gas temperature should be recorded at one-half hour intervals during the test, and an average of these taken as the gas temperature.

The barometer is read at the same time as the gas temperature is taken. These readings are likewise averaged.

General considerations of the nature of the gas under test will enable the operator to approximate the volume of gas, which should be used as follows:

(1) If the gas is residual gas from gasoline plants, 400 cubic feet should be ample for the test;

(2) If the gas is untreated gas from wells, 300 cubic feet should be passed;

(3) If the gas is from oil wells or very low-pressure gas wells, 100 cubic feet should be passed.

It is, of course, understood that as the vapor content of the gas increases, no matter what the origin of the gas, the volume of the gas passed in a test should be decreased to an amount which will yield not to exceed 40 cubic centimeters of condensate per liter of oil distilled from Absorber A-1.

When the selected volume of gas has been passed through the apparatus, as shown by the meter, close valve G and then valve F. Allow the gas from the absorbers to vent through the meter until the U-gauge shows zero pressure. Close valves H, I, J, K, and L, in order given. Read the meter and note the time. Detach absorbers and set in a cool place.

B. *Procedure of Distillation*

Pour from the Absorber A-1, Diagram No. 2, 750 c.c. of oil. Assemble the distillation apparatus, as shown in Diagram No. 3, and proceed with the distillation as specified below:

1. The condenser and receiver shall be iced so that a temperature of 32° F. to 34° F. may be obtained.
2. The condenser shall be clean.
3. 750 c.c. of the oil shall be introduced into the flask.
4. Two gauze cones shall then be placed in the neck of the flask, the tip of the first at the base of the column and the top of the second, just below the side outlet.
5. The thermometer with its bulb extending just below the side outlet shall be fitted tightly, in the flask, by means of a cork.
6. The receiver shall be tightly connected to the discharge of the condenser.
7. The line carrying un-condensed vapors shall be connected to the intake of a suitable meter.
8. The distillation shall be carried out by so regulating the flame that the test may be completed in approximately 45 minutes.

The distillation shall be considered complete when the thermometer shows a reading of 350° F.

As an additional precaution in control, the condensing ring of oil which appears

(*Continued on Page* 58)

Clow "Gasteam" Radiation

A unit system of cast iron steam radiators—using gas for fuel. *Vented and non-vented.*

Passed by the U. S. Bureau of Standards with a rating of *absolute zero* on monoxide test.

The only "Gasteam" radiator included in the published "List of Inspected Mechanical Appliances" of the National Board of Fire Underwriters.

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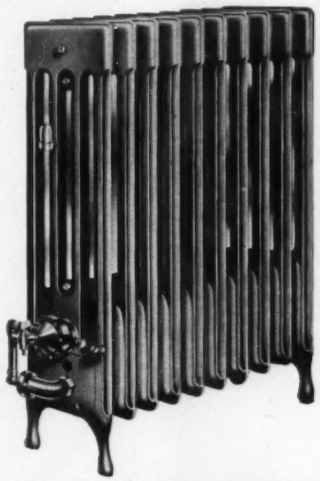

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Los Angeles, California - - - San Francisco, California

Selling Apartment Houses *to* Gas

(*Continued from Page* 43)

The biggest job is to convert the dealer who is selling the wrong character of equipment or is selling equipment burning other fuels rather than gas when gas is the proper fuel to use. This sort of dealer must be converted before very much headway can be made. Of course all dealers in appliances using other fuels than gas cannot be converted, because they do not wish to give up the lines which they are carrying, but this can be overcome by converting the architects, engineers and owners and getting them to specify gas fired equipment. As an example of this, one of the largest manufacturers of cast iron steam boilers in the United States is compelled to install gas burners in order to meet specifications, although the boilers are built for coal and fuel oil.

This condition is the result of a continuous campaign carried on for a number of years by the new business departments of the gas companies here—first calling on the owner, then calling on the architect, and keeping ever and eternally at it, never taking no for an answer until the owner and the architect have both been converted.

And this has been no easy task, as the owner of every apartment house has to run the gauntlet of a small army of salesmen selling oil burners and fuel oil burning appliances. At the present time, however, there are so many good gas-fired boilers on the market that dealers in oil burning equipment have had to turn to gas for self-preservation.

Soliciting the Right Business

What has been accomplished here can be accomplished elsewhere if the right effort is put back of the movement and care is taken not to install gas where the buildings are so large that fuel oil is the proper fuel. And this is why, as I have previously mentioned, a line should be drawn as to the size of houses which should be supplied with gas, because there is a place for fuel oil as well as for gas, and the mistake should not be made of trying to displace fuel oil unless the consumer can be benefitted.

In old apartment houses using other than gas fuel the salesman is confronted with an entirely different problem, because the installation is already made and must be partially displaced; at least the burners must be changed. Usually these houses have been leased for a term of years, which eliminates the owner and forces the salesman to deal with the lessee. Before the lessee will spend any money he must be shown that the expense involved will be more than returned over the period of his lease, and very often it is necessary to give the lessee or landlord from six to twelve months in which to pay for the work on the installment plan.

The First Month's Bill

It has been our experience that the first month's bill is the determining factor as to whether or not the gas installation is to remain, and therefore we make every effort to have the installation working properly right from the start. This not only involves the proper installation of burners, but extends to the size of service, size of meter, pressure, and anything else that could in anywise affect the operation of the installation.

Testing Natural Gas *for* Gasoline

(*Continued from Page* 56)

just before the distillation is complete should not be allowed to rise higher than one inch in the column.

After the completion of the distillation the volume of distillate is noted, and the distillate is then run into a cold bottle and stored for subsequent study. A second distillation of another 750 c.c. sample from the first absorber is now run. If a check result is obtained, the first absorber is emptied, the exact volume of oil is recorded, and the gravity and temperatures taken.

Similar distillations are next carried out on the oil from absorbers two and three.

5. Calculation of Results

Gas Volume

1. Correct the gas volume metered at the outlet of the absorbers to 60° F. and 30″ of mercury.

2. From the volume of condensate recovered by the distillations and the aliquot parts used, as well as the volume of oil recovered from the absorbers, calculate the total volume of condensate contained in the oil from the three absorbers.

3. Calculate the volume of vapor that this total volume of condensate would make, on the basis that one gallon of condensate makes 35 cubic feet of vapor.

4. Correct the volume of gas measured at the outlet of the condenser during the distillation to 60° F. and 30″ mercury. See 7, in Procedure of Distillation.

From the aliquot parts of oil used for the distillations and the volume of oil recovered from the absorbers calculate the total amount of non-condensable gas contained in the oil of the absorbers.

5. Take as the total gas volume the sum of the items calculated under 1, 3, and 4, above.

6. Computation of Yield

The gallons of fluid per million cubic feet of gas may be computed conveniently according to the following formula:

$$\frac{264.2\ B}{A} = X \text{ gallons of fluid per million.}$$

Where A=The total corrected gas volume (item 5, Calculation of Results), and

B=Calculated total condensate contained in the oil in the absorbers (item 2, Calculation of Results).

The result (X) is gallons per million, the volume of liquid being measured at 32° F. and the volume of the gas being measured at 60° F. and 30″ of mercury pressure.

Appliance Dealers Unite *in* New Association

(*Continued from Page* 44)

its quota towards correcting it.

The Association, aspiring to a high standard of appliance merchandising, desires to work in harmony with all forward movements looking toward that end. For example, there is covering the entire United States a movement known as the Better Homes Movement, which is being fostered by all concerns engaged in the home furnishing industry. As our business is that of catering to the welfare of the public of Southern California through the sale of gas burning appliances which are either used for heating or cooking purposes, and as it is the spirit of the Better Homes Movement to lay all consideration of price aside and to study carefully the actual needs and financial resources of all clients, it necessarily becomes incumbent upon us to see that the best interests of the consumer are considered and that he secures that merchandise which will serve him honestly and faithfully with a minimum of expense and with the element of danger removed. To this end we, the members of the Association, pledge ourselves, that our craft may be uplifted through this service to which we are consecrated.

COST OF WASTED HEAT

American home owners and tenants pay approximately $450,000,000 annually, and industrial users nearly a billion dollars, for wasted heat, according to engineers who have studied the fuel requirements of the country. This loss comes chiefly from extravagant and inefficient use of fuel, and from wasteful standards of construction.

-it shuts off-

About all you ask of a valve is that it will open and shut and that it won't leak. Yet how few answer these simple requirements.

The Merco Nordstrom Valve is a lubricated plug valve that never fails.

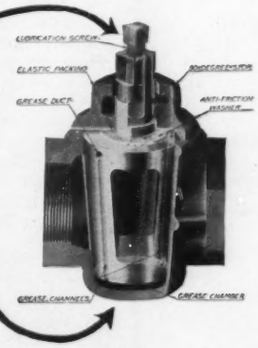
High pressure illuminating gas, corrosive gases, hot or cold liquids do not affect it because the lubricant seals the valve and prevents leakage or sticking.

It won't stick and it won't leak

Lubricant sticks are put in here

Turning down the screw forces the lubricant under the plug here

This lifts the plug by hydraulic pressure and lubricates it at the same time. Write for Catalog.



Merco Nordstrom Valves

Merco Nordstrom Valve Co.

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National Building, Cleveland
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"Fifty-Fifty"

During 1924 Los Angeles Gas and Electric Corporation paid in round numbers, $1,380,000 in Federal, State, County and City taxes.

The dividend on the Preferred and Common stock of the Corporation for the same period was approximately $1,420,000.

Thus, the Government and the Stockholders received nearly equal shares of the year's earnings.

This illustrates the manner in which the public utility corporation contributes to the support of the Government and at the same time yields "a fair return" to its investors.

Los Angeles Gas and Electric Corporation

"WEMCO" Double Pump Valve

For SIMPLEX and DUPLEX PUMPS

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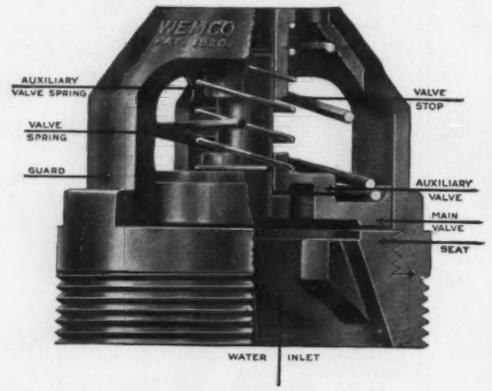

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International Petroleum Exposition—Oct. 1-10

E. F. McINTYRE, general manager of the International Petroleum Exposition, is authority for the statement that the 1925 Exposition, dated for October 1 to 10, at Tulsa, Okla,. will set a new high water mark in the field of oil and gas exhibits.

The First Annual Safety Tournament and First Aid Meet, being organized by the National Safety Council and the Petroleum Safety Council of the Mid-Continent Oil and Gas Association is to be a new and interesting feature of this year's Exposition.

Unprecedented support to the Exposition is being given by the oil and gas industry, states Mr. McIntyre, as indicated particularly in the fact that over one-half of all available exhibit space was reserved in a period of six weeks. Equipment manufacturers, he asserts, in making arrangements for space thus far in advance of the Exposition date, indicate their confidence in the merit of the Exposition as a selling force.

The building and grounds on which the Exposition is conducted are now the property of the Exposition, and have been enlarged somewhat, with the introduction of several convenience features that assure adequate service to exhibitors. Expectation of a greatly increased attendance over previous years is causing the management to make additional provision for parking, refreshments, and other accommodations.

Lee B. Mettler Secures Patent *on* Gas Burner

LEE B. METTLER, owner of the Lee B. Mettler Company, Los Angeles manufacturers of gas burners, has just been notified by the United States Patent Office that he has been allowed patent No. 1,539,093 on his late improvement on gas burners for large industrial plants.

Will Increase Manufacture

Mr. Mettler states that the issuance of this patent will further advance the manufacturing of this new product in Los Angeles, as this invention covers what is practically the only available equipment now manufactured to burn the lighter hydrocarbons which remain after absorption and compression methods of extracting gasoline from the gas have removed the heavier hydrocarbons.

Over 110,000 B. H. P. have recently been equipped with this new gas burner throughout the natural gas fields by the Lee B. Mettler Company, and tests have shown considerable increases in efficiency in burning of natural gas over previous burner construction, according to Mr. Mettler.

Big Orders in Hand

The company has plans under way for branching out in this new field of manufacture. Among the numerous large orders recently received for this type of equipment are the orders for equipping the entire refinery of Elliott Jones and Company at San Antonio, Texas, and the American Beet Sugar Company's plant at Oxnard, Calif.

ROCKY MOUNTAIN GAS CO. LAYING PIPE LINE

The Rocky Mountain Gas Company, a subsidiary of the Ohio Oil Company, Casper, Wyoming, has been granted a certificate of convenience and necessity for laying a gas line from Oregon Basin field to Cody, Wyoming, and laying of the line will begin as soon as a city franchise is obtained.

Interesting Session *of* L. A. Appliance Group

ON July 17 was held an unusually important meeting of the Gas Appliance Association of Southern California, at the Evening Express Building, Los Angeles.

Mayor's Committee Represented

The three members of the sub-committee of the Mayor's Committee on carbon monoxide were present at the request of the Association and outlined to those present the work of investigation which has been carried on during the last several months. The sub-committee consists of H. L. Masser, gas engineer of the Los Angeles Gas and Electric Corporation; Walter M. Berry, engineer of the California Gas Research Council; and C. C. Shoemaker, representing the Mayor.

Mrs. Anna J. Peterson, director of the home service department of the People's Gas Light and Coke Company of Chicago, was also present at the meeting and told of her work. The annual sales output through her department is 75,000 gas ranges, and hence her message was taken as authoritative.

Paper on Service Bureau

Harry Payne, vice-president of the Payne Furnace and Supply Company of Los Angeles and a director of the newly organized Association, read a paper on a "home service bureau" which was received with so much enthusiasm that mimeographed copies were ordered to be made and may be had by anyone interested, upon application to George Finney, secretary of the Appliance Association, Room 500, 420 South Spring Street, Los Angeles.

Utility Department *at* Ad Clubs' Convention

THIS year's Pacific Coast Advertising Clubs' convention held at Seattle, July 20th to 23rd, for the first time had a Public Utility Advertising Department.

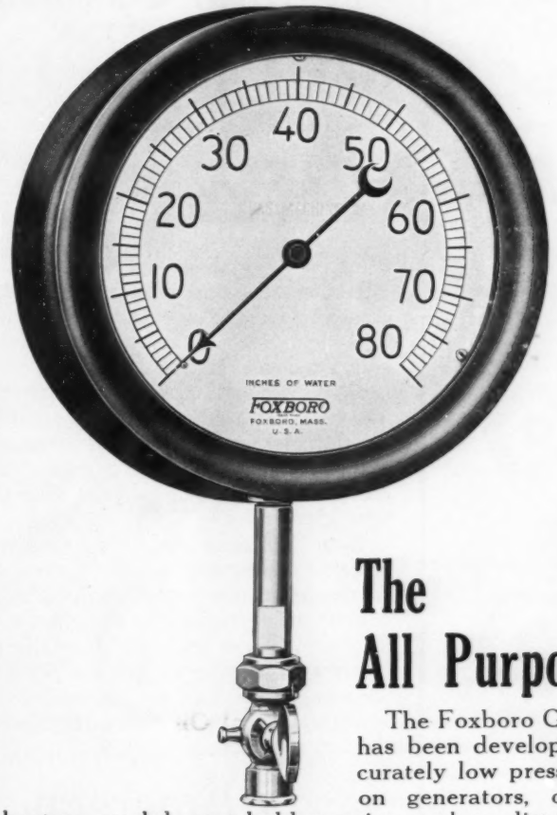
F. H. Holden of the Southern California Gas Company, D. L. Scott of the Los Angeles Gas and Electric Corporation, and Clyde Potter of the Southern Counties Gas Company, represented the California gas industry.

The prize for the best display of public utility advertising was awarded to the Los Angeles Gas and Electric Corporation. Mr. Scott, Director of Advertising for the Los Angeles Gas and Electric Corporation gave an interesting address on "The Genus Blah." He said, in part:

"The threat of political absorption by the public ownership advocates is an element which tends to prepare the public utility advertising soil for the roots of many plants of the genus blah. The soil is cultivated and enriched by agitators whose professional and political advantage is to fulminate against all public utilities. These efforts are ably seconded by the yellow papers which rise in valor to the defense of the people whenever a sluggish circulation needs a shot in the arm with the hypodermic of sensationalism."

CARL F. BRAUN ON EUROPEAN TRIP

Carl F. Braun, President of C. F. Braun & Company, Alhambra, California, is spending several months abroad studying European and Asiatic oil refining methods. His firm enjoys a large export business of heat exchange apparatus and natural gasoline recovery apparatus, all manufactured in California.



The All Purpose Gauge

The Foxboro Gas Machine Gauge has been developed to indicate accurately low pressures and vacuums on generators, carburetors, superheaters, wash-boxes, holder mains, and on distribution and pumping lines.

Calibrations range from 0-3 inches of water, 0-4 inches, 0-60 inches, 0-80 inches to 0-100 inches. Thousands of these all-purpose gauges are giving accurate day-in-and-day-out service in many of the largest gas plants in the country. Write for Bulletin 136-1.

THE FOXBORO CO., Inc.

Neponset Avenue, Foxboro, Mass., U. S. A.

New York Chicago Philadelphia Boston Pittsburgh
Cleveland Tulsa Rochester Birmingham Seattle
San Francisco Los Angeles Portland, Ore.

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Company .....

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The EMPIRE

Positive displacement, oscillating piston design.

Different from every other type of meter.

Unsurpassed in over forty years for accuracy, durability, and low cost of upkeep.

Used with highest satisfaction by

Gas Companies

in every section of the country.

Made in all sizes, 5/8 in. to 6 in., inclusive.

EMPIRE Oscillating Piston Oil Meters are fully described and illustrated in Circular 110-W. Send postal for your copy.

National Meter Company

299 Broadway, New York

Chicago Boston Atlanta
San Francisco Cincinnati
Los Angeles

Natural Gas *now* Used in Pasadena

(*Continued from Page* 39)

pany the use of gas, and are hoping to shut down one boiler now in operation. This in itself would mean a considerable economy."

Means Industrial Use

Bringing natural gas into Pasadena is highly significant from a "new business" point of view, according to Mr. Frank Weiss, new business manager of the Los Angeles Gas and Electric Corporation. The new line reaches both Alhambra and Pasadena, and in both cities there has long been felt a need for this ideal industrial fuel. Now, with a gas high in B. t. u.s available to all industrial users in both districts, a good many change-overs may logically be expected, says Mr. Weiss.

Both Pasadena and Alhambra welcome an opportunity to offer natural gas to manufacturers contemplating the location of factories in this territory. There have been several instances in the last few years where a natural gas service would have been the influencing factor in securing the location of new industries in this section.

Rates on the new gas service, according to Mr. Weiss, are such that no one now requiring fuel for industrial use can afford to use anything else. In Pasadena alone he anticipates from 10 to 12 services, with several more in Alhambra. Prior to the construction of the new line only domestic gas was supplied throughout this territory, and the introduction of a high quality natural gas should work wonders in the industrial development of the section.

Conserving a Resource

Any extension of natural gas service, such as that at Pasadena, should be hailed with favor on several scores, and not the least of these is the influence such extension has on conservation of a diminishing natural resource, fuel oil. It has been emphasized before but deserves re-emphasis, that oil is capable of storage and should logically give way to natural gas as a move in the direction of conservation. We are rapidly coming to appreciate the fact that prodigality in use or waste of either oil or gas is the rankest form of national waste.

An Emergency *in* Santa Barbara

(*Continued from Page* 41)

highest praise for his men and for the outside company men who were rushed to the scene to work during the emergency. He said that all men did heroic work and the earthquake showed up the caliber of the employees.

With housing conditions inadequate and in order to cause no inconvenience to the city's already overtaxed emergency housing quarters, the gas company imported 50 army cots for its men. The Red Cross at Santa Barbara furnished mattresses for these cots. The outside men brought bedding with them and for more than a week the emergency crew lived and ate in the open in true army style.

Company Executives Aid

The company threw all of its resources into the movement to resume gas service at Santa Barbara. A few hours after the quake, F. H. Bivens, general agent, from the Los Angeles office, arrived in Santa Barbara and worked with Manager Rutledge on the problems confronting the company here. Mr. Bivens remained on the ground during the next two-weeks period and rendered valuable assistance. F. S. Wade, manager, M. R. Thompson, engineer, A. F. Bridge, executive engineer and other officers of the company took an active part in the work of rebuilding the Santa Barbara properties.

A week after the earthquake President Ferdinand R. Bain came up from Los Angeles and presented Henry F. Ketz, the engineer at the gas plant, a handsomely engraved gold watch in appreciation of his act in shutting off the gas on the morning of the earthquake. A few days later, when the service had been resumed, President Bain returned to Santa Barbara and officially thanked the city government through Mayor Andera, for the hearty co-operation extended company officials and employees during the 10-day period. Accompanying President Bain were T. H. Dudley, treasurer, F. S. Wade, manager, and other representatives of the utility.

"We are mighty proud of our employees who worked at Santa Barbara," said President Bain. "Men from various cities on our system were rushed to the stricken city a few hours after the shock and for more than a week worked constantly until gas service was resumed. We were able to turn gas back into the mains in record time, thanks to the loyalty and willingess of the 100 men we had on the scene, and I take this opportunity of thanking each and every one of our loyal workers for the part played during this acute emergency."

Fulton Gas Fuel Steam Boiler Governor

THIS Governor automatically feeds gas to the boiler furnace in such quantity as to maintain a constant given steam pressure under varying conditions of load.

It consists of a set of valves opened by a weighted lever and closed by the steam pressure of the boiler, thus admitting or shutting off the gas as the demand for steam on the boiler varies.

It will maintain a constant and unvarying pressure of steam from 1 to 150 pounds or more, automatically, no matter how frequently or how greatly the demand for steam varies. Write for our catalogue.

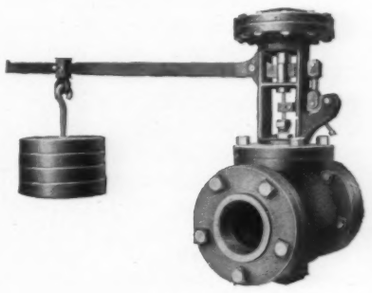
The Chaplin-Fulton Mfg. Co.

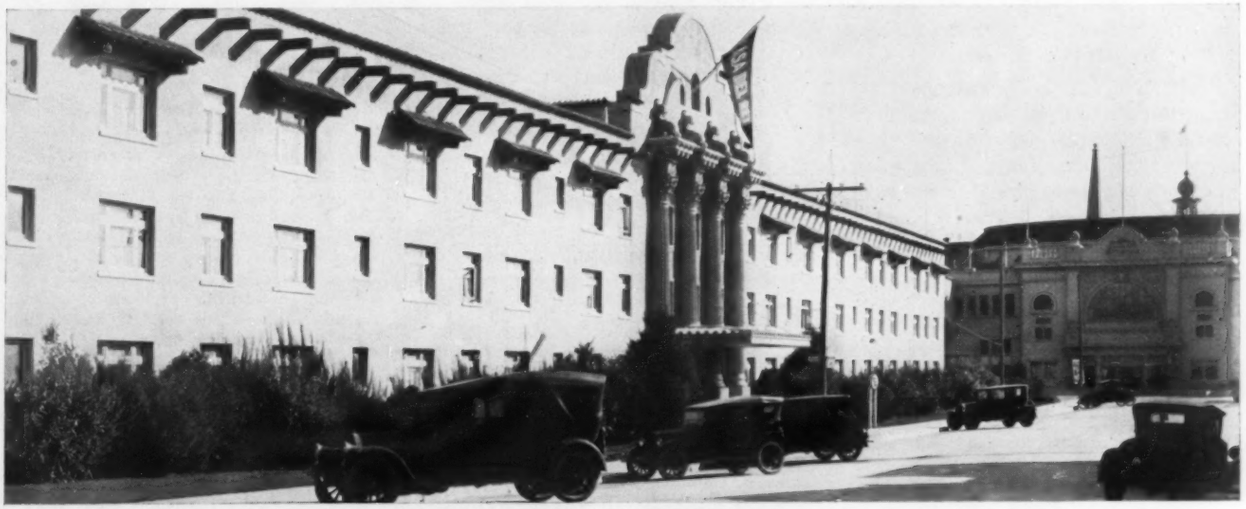
Organized 1884 — Oldest Builders of Gas Regulators in the Country. Built in all Sizes, From 1 Inch to 24 Inches; For All Service. 1 oz. up to 1,600 Lbs. Pressure to Square Inch.

28-34 Penn Avenue Pittsburgh, Pa.

J. H. HILL, Representative

Union Bank Bldg.—Telephone VAndike 7114
Los Angeles, Calif.





IN SANTA CRUZ

the largest hotel—the Casa del Rey—uses gas exclusively for cooking.

You are cordially invited to Santa Cruz—to Hotel Casa del Rey

Golfing Riding Bathing—

a wonderful opportunity for rest, exercise and recreation

Coast Counties Gas and Electric Company

SANTA CRUZ, CALIFORNIA

Gas Utility Rate Making

(*Continued from Page* 35)

total of the operating revenue of the utility will yield a fair and adequate return upon its investment. In this connection, a fair return may be indicated to be a reasonable surplus after deducting operating expenses, which consist of production, distribution, commercial and general expense, together with taxes and depreciation.

The Rate Base

In some states, the net return is generally expressed in terms of a percentage of the rate base. The rate base itself consists of the summation of average annual invested capital (June 30th) based upon a reasonable historical reproduction cost of operative property at time of installation, an average annual allowance for materials and supplies, based upon actual costs, an average annual working cash capital consisting of one month's supply of gas or oil fuel, two months' other operating expenses except fuel and taxes, from which total is deducted one-fourth of the annual taxes. Operating revenue is generally taken as all revenue accrued except merchandise sales and uncollectible bills.

Of the above, all of the elements of revenue and expense are readily deductible from actual operating statistics and the element of greatest importance becomes the valuation of the capital investment with a proper allowance for depreciation and replacements.

Peak Demands and Investment

In some communities such as we have in California where there occurs great seasonal variation of demand, the question of an adequate capital investment to take care of peak demands becomes important. Taking, for example, the system of one of our larger companies from which are supplied some 300,000 domestic consumers, the minimum daily sendout during the year 1924 was 21 million cubic feet of gas, while the maximum daily sendout during the same year was 105 million cubic feet. In order to adequately take care of this wide fluctuation of demand, it has been necessary for the utility to increase its capital investment per consumer from $90.00 in 1920 to $158.00 in 1925.

On this same system an analysis of the blocks of consumers and the annual consumption of gas by them indicates the following:

Block	*% of Total Consumers*	*% of Total Consumption*
0-1000	11.1	1.4
1000-5000	63.8	38.6
5000-20000	23.0	37.7
20000-50000	1.4	8.9
Over 50000	0.7	13.4

The carrying costs of the investment necessary to take care of all of these consumers are entirely independent of the amount of gas used per year, as are also the costs of keeping consumers' accounts and of maintaining the service, meter and other equipment provided for the use of the consumer. In the first place it is necessary to maintain throughout the year adequate plant capacity to meet the demand during the peak months. Much of this equipment remains idle during the summer months, but the charges go on just the same. In the second place the costs of keeping the account, reading the meter, billing, maintaining the service, meter and other equipment, are just as high on the meter of the small consumer as on the meter of the large consumer who uses many times the amount of gas used by the smaller consumer.

The Three Part Rate

In some states the so-called "Three Part Rate" has been introduced. This rate consists of

1st. A consumer charge, which is uniform for all consumers and which covers certain fixed charges, expenses and operating costs, such as overhead, office maintenance and operation, meter reading, billing, etc.

2nd. A uniform charge per unit of demand. This charge, which is based upon each consumer's maximum demand, covers cost occasioned by the extra investment in plant required to supply its maximum demand over and above the investment that would provide all the plant called for by the average demand.

3rd. A uniform charge for the gas served at a fixed rate per thousand cubic feet used. Under this charge there are billed to each consumer those expenses which vary directly with the amount of gas which the company must supply, and these charges are billed to each consumer directly in proportion to the amount of gas that he consumes.

In conclusion it might be stated that in order that any system of gas rates may be just and equitable it should distribute all of the costs of service between individual consumers in direct proportion to their responsibility.

Further, that it should encourage the efficient utilization of gas and discourage the extravagant and wasteful use of same. And finally that it should furnish service to the consumer at a reasonably low cost consistent with the yielding of an adequate return to properly maintain and enlarge the operating department of the public utility furnishing the service.

Credits *and* Collections Sub-Committee Reports

(*Continued from Page* 33)

recommended as a means of capitalizing character and earning power of customers, but the inadvisability of overloading the customer is indicated. Liberal credit arrangements with employees are advocated. A need for more credit and collection reports giving facts covering the operation of the department is stated. Uniformity in forms of reports from different companies is advocated as an aid to comparisons of operation costs and percentage of loss.

In conclusion the report offers a schedule as a basic structure on which to build a system for reporting statistical information on the factors in credit work. Throughout the report a number of type forms used in collection, etc., are given.

Convention Bound

GENERAL GAS LIGHT COMPANY HAS NEW BUILDING

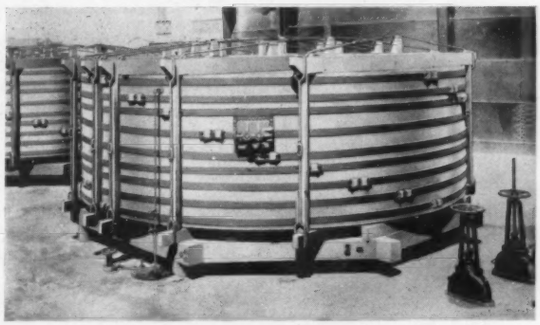
Announcement has been made by C. B. Babcock, Pacific Coast Manager for the General Gas Light Co., manufacturers of the Humphrey Radiantfire and other gas appliances, of the occupation by the company of new offices at 135 Bluxome Street, San Francisco. The new building, which is of modern fireproof concrete construction, is ideally located in one of San Francisco's best manufacturing districts.

NEW OFFICE FOR E. A. KEY COMPANY

E. A. Key of the E. A. Key Graphite Paste Company left Los Angeles on July 17 en route to St. Louis. An office and warehouse is to be opened by the Company in Denver. Mr. Key is returning to the Coast via Portland, where he will attend the Pacific Coast Gas Association Convention. Capital stock of the E. A. Key Company has recently been increased from $10,000 to $50,000.

CENSUS OF CRACKING PLANTS COMPILED BY MINE BUREAU

The Bureau of Mines has compiled a census of cracking plants in the United States. which is issued under date of June 15, 1925. This list is given by divisions, naming the company, number of units, charging capacity and type of process. A summary by divisions is given, also a summary by types and a summary by status (operating, building or shut down).



30 Dia. x 9 Stave "Jones Type" Purifiers Installed for Pacific Gas & Electric Co.

Purifiers

Made of California Redwood will save you considerable money. The first installation cost is less.

"REDWOOD THE WOOD ETERNAL"

P G & E Co have approximately 40 of these purifiers in use—built by us.

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Dept. of Tilden Lumber & Mill Co.
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4820 Santa Fe Ave., Los Angeles
400 High St., Oakland

KING-KNIGHT COMPANY

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MECHANICAL AND ELECTRICAL EQUIPMENT

LOS ANGELES — SAN FRANCISCO — SEATTLE

REPRESENTING

STERLING ENGINE CO.
High Duty, High Speed Internal Combustion Engines From 60 h. p. to 375 h. p., for Use With Gasoline, Artificial or Natural Gas.

SKINNER ENGINE CO.
Universal Unaflow and Counterflow High Economy Automatic Steam Engines—Steam Driven Compressors

HEINE CHIMNEY CO.
Reinforced Concrete Chimneys, Radial Brick Chimneys.

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Reeves Heavy Duty Slow Speed Gas Engines, for Operation on Natural or Artificial Gas; Reeves Gas Engine Driven Compressors.

POOLE ENGINEERING & MACHINE CO.
Herringbone Gear Speed Reducers.

W. A. JONES FOUNDRY & MACHINE CO.
Spur Gear Speed Reducers, Worm Gear Speed Reducers, Flexible Couplings, Gears, Pulleys, Transmission Equipment.

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Canvas Covered Bags
Safety Service Plugs
Gas Main Plugs
Pipe Cleaning Brushes

GOODMAN
Used since 1897
Improved Locking Sleeve
GAS MAIN STOPPER

Asbestos Lead Joint Runners
Air Line Gas Masks
Derricks
Packings, etc.

Safety Gas Main Stopper Company

523 Atlantic Avenue **Brooklyn, New York**

C. B. BABCOCK COMPANY
Western Representatives

768 Mission Street
San Francisco

Marsh-Strong Bldg.
Los Angeles, Cal.

The Complete Convention Program

(*Continued from Page* 39)

Report of Meter Bureau
J. E. Kelley, Chairman, Western States Gas & Elec. Co.

Committee Reports—
Installations—W. D. Dickey, Chairman, Pacific Meter Works
Diaphrams—Otto Goldkamp, Chairman, San Diego Consolidated Gas and Electric Co.
Statistics—E. A. McCallum, Chairman, Pacific Gas & Electric Co.

Report of Distribution Bureau
R. M. McCauley, Chairman, Portland Gas & Coke Company

Committee Reports—
Unaccounted For Gas—W. M. Henderson, Chairman, Los Angeles Gas & Electric Corp.
High Pressure Distribution—R. R. Ripley, Chairman, Portland Gas & Coke Company
Materials—M. R. Thompson, Chairman, Southern Counties Gas Company
Pipe Protection — S. H. Graf, Chairman, Oregon State Agricultural College

Paper—"Protection of Underground Pipe," Dozier Finley, Paraffine Companies

Paper—"The Extension of Pipe Life," H. S. Christopher, Southern California Gas Company

Report of Steam Production Bureau
C. M. Cole, Chairman, Southern California Gas Co.

Committee Reports
Boiler Fuels—F. H. Bivens, Chairman, Southern Counties Gas Co.
Boiler Furnaces — C. E. Capell, Chairman, Portland Gas & Coke Company
Waste Heat Boilers—C. H. Wilcox, Chairman, Los Angeles Gas & Electric Corp.

Paper—"Reconstruction of a 1,500,000 Cu. Ft. Gas Holder," R. M. McCalley, Portland Gas & Coke Company

ENTERTAINMENT

Bound for Portland

Monday Evening: 9:30 P. M.—Reception to Officers—Informal Dancing

Tuesday Evening: 9:00 P. M.—A trip down the River on the good ship Swan. Dancing and Entertainment.

Wednesday:—Mount Hood Loop Drive —All Day

Thursday Evening: 9:00 P. M.—Convention Ball

Friday Evening: 6:30 P. M.—Annual Banquet of Pacific Coast Gas Association.

Golf:
An opportunity will be given golfers to take the Babcock-Pederson-Basford Challenge Cup away from Paul Overton, the present holder, at a tournament to be held at the Oswego Country Club on Thursday afternoon. Other opportunities for golf will be afforded those who have lost their souls to this pastime.

SPECIAL ENTERTAINMENT FOR LADIES

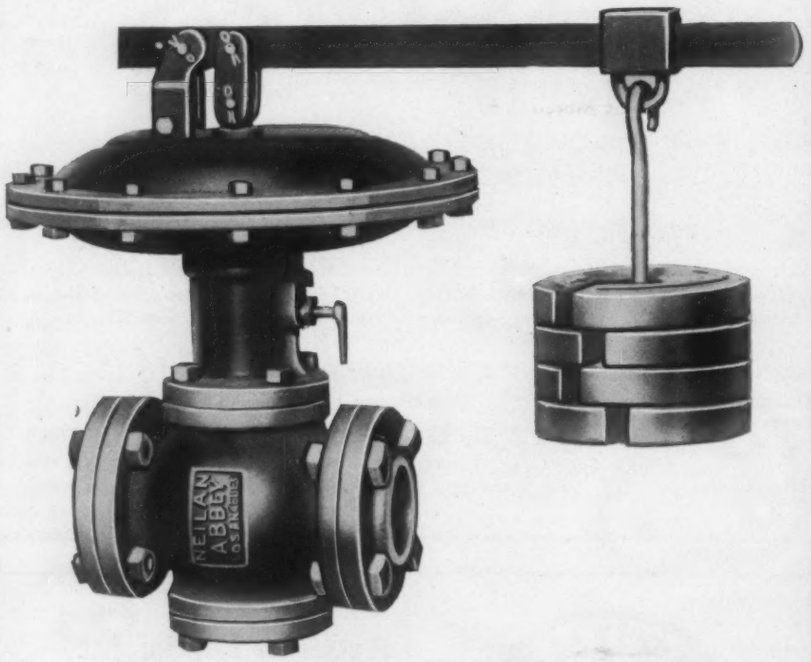
Monday Afternoon: 4:00 P. M.—Tea in Gold Room

Tuesday Afternoon: 2:00 P. M.—Theatre Party—Orpheum Theatre

Thursday Noon: 12:00 M.—Luncheon and Card Party at Crown Point Chalet on Columbia River Highway

Friday Afternoon: 2:00 P. M.—Scenic Drive, Tea at Waverly Country Club.

NEILAN-ABBEY
GAS GOVERNORS and REGULATORS



Low and High Pressure Types for all classes of Gas distribution service.

Fully balanced through all positions of Valve travel.

Self contained—no equalizing pipe, easy and simple to install. The general design and construction of these Regulators eliminate practically all friction. The Valves absolutely will not stick or bind.

Non Chattering, Perfectly Balanced and Cushioned Under All Service Conditions.

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Stauffer's FERROX Purifier

meets these essential requirements of a good Gas Purifier

A highly active Iron precipitate, with a high Iron content. A thoroughly impregnated and porous bulky mass, ready to use, no mixing, no delay, always uniform

A dependable source of supply

Stauffer Chemical Company

Pioneer manufacturers of Industrial Chemicals on the Pacific Coast.

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Gas Governors and Regulators

(With or Without Mercury Seal)

High Pressure Service Governors
Low Pressure Service Governors
Separate Mercury Seals
Single District Station Governors
Double District Station Governors
Holder Governors
Intermediate Pressure Governors
High Pressure Line Regulators
Relief and Back Pressure Valves
Anti-Vacuum Quick Closing Valves

Free Engineering Service on all Pressure Conditions—Write Us

Reynolds Gas Regulator Company

Main Office and Factory **Anderson, Indiana**

METERS

FOR

Natural — Manufactured and all kinds of

GAS

Westinghouse Positive Fluid Gas Meter. An all-metal meter for either HIGH or LOW Pressure, Manufactured or Natural Gas.

Specially adapted to Commercial or Industrial Services.

Ironclad Cast Iron Dry Gas Meter—for Domestic and small Industrial or Commercial Services, either Natural or Manufactured Gas.

Prices and Complete Information gladly furnished on request to office nearest you.

Pittsburgh Meter Company

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New York—50 Church St.
Chicago—5 So. Wabash Ave.
Kansas City—Mutual Bldg.
Columbia, S. C.—1433 Main St.
Seattle—4038 Arcade Bldg.
Los Angeles—Union Bk. Bldg.

J. H. HILL, Representative

Union Bank Bldg.—Telephone VAndike 7114
Los Angeles, Calif.

ADVERTISERS INDEX

The Alpha-Lux Co., Inc. 67

Beacon Light Company 51
C. F. Braun & Co. 3
Byllesby Engineering & Management Corp. 15

Coast Counties Gas & Elec. Co. 63
C. & G. Cooper Co. 36-37
Chaplin-Fulton Mfg. Co. 63

The Foxboro Co., Inc. 61

Jas. Graham Mfg. Co. 50
General Gas Light Co. ..... *Third Cover*

Hammel Radiator Corp. 48
Paul G. Hoffman Co., Inc. 17

International Petroleum Expo. & Congress 19

King-Knight Co. 65
E. A. Key Company ..... *Second Cover*
Kauffman-Norton Co. 52

Lattimer-Stevens Co. ..... *Fourth Cover*
Llewellyn Iron Works 16
Los Angeles Gas & Electric Corp. 59

Lee B. Mettler Co. 12
Merco Nordstrom Valve Co. 59
Chas. C. Moore Co. 14
W. E. Mushet Co. 60

National Meter Company 62
Neilan-Abbey & Co. 66

Oliver Continuous Filter Co. 8

Pacific Gas Radiator Co. 45
Pacific Gas & Electric Co. 9
Pacific Foundry Co. 60
Pacific Gasteam Co. 57
Pacific Tank & Pipe Co. 65
Pacific Meter Works 7
The Paraffine Companies, Inc. 1
Pittsburgh Meter Co. 68
Potter Radiator Corporation 49

Reliance Manufacturing Co. 10
Reynolds Gas Regulator Co. 67

Safety Gas Main Stopper Co. 65
S. B. Sexton Stove Co. 47
Southern California Gas Co. 13
Southern Counties Gas Co. 11
Sprague Meter Company 57
Stauffer Chemical Co. 67
Stockton Fire Brick Co. 64

United States Cast Iron Pipe and Foundry Co. 5

Westcott & Greis, Inc. 4
Western Gas 53
Western Machinery Co. 6
Western Pipe & Steel Co. 18
Western Sheet Metal Works 52
Williams Radiator Company 57

HISTORIC PERIOD DESIGNS
in The Humphrey Radiantfire

WE HAVE here reproduced, from an old print, the beautiful room which was Sir Walter Scott's study in his beloved Abbotsford, Scotland. Note particularly the fire-basket—an exceptionally fine example of English creative craftsmanship of the late 18th and early 19th centuries. It is from just such authentic sources as this that the inspirations for the Period Models of the *Humphrey Radiantfire* have come. Their resulting beauty of design, combined with mechanical superiority, are the reasons for *Humphrey Radiantfire* leadership.

Manufactured by
GENERAL GAS
LIGHT COMPANY
Kalamazoo, Mich.

Humphrey Radiantfire "Adam" Design, expressing a notable period in English interiors.

Pacific Coast Manager
C. B. BABCOCK
135 Bluxome Street,
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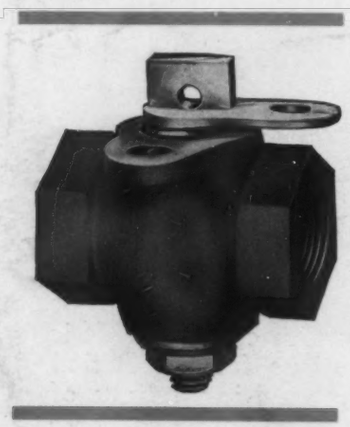
The HUMPHREY
Radiantfire
REGISTERED TRADE MARK

Iron Body Stop Cocks Give Increased Strength and Greater Service

The strong iron body of the L-S stop cock gives it the strength which prevents leaks due to strains and hard usage.



Strong iron body stop cock with brass core. Heavy red brass key is ground into body to make it gas-tight.

LATTIMER-STEVENS STOP COCKS are made of the highest grade gray iron and brass castings so have the recognized advantage of the brass to iron fit. The brass key—durable, tough and fitted accurately—is the softer of the two metals and this properly allows it to grind into the seat of the body as it wears.

All parts are carefully machined and the red brass key is ground into the iron body to make a gas tight fit. Every stop cock before leaving our factory is tested by a heavy air pressure under water, thereby assuring you a gas tight fitting when placed in your service.

In order to eliminate binding and to insure easy turning throughout the life of this stop cock, the bottom of the body on which the washer fits is faced between the two center points of the key. Both surfaces of the washer are also machined so that they are parallel, insuring easy operation and longer life.

L-S stop cocks furnished in either round or plain opening styles.

Samples, catalog and prices upon request.

The Lattimer-Stevens Company

72 Yale Ave. Columbus, Ohio

New England Representative
The Eastern Service Co.
Boston, Mass.

New York Representative
Mulcare Engineering Co.
100 Park Place, N. Y.

Pacific Coast Representative
A. P. Bartley
San Francisco, Cal.

LattimerStevens

METER CONNECTIONS~SHELVES
STOP COCKS ~ ~ ~ AND SEALS